



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

### Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

### About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

UC-HRLF



\$B 273 681

# KEY

## ADVANCED ARITHMETIC

JOHN WILEY & SONS

NEW YORK CHICAGO LONDON

LIBRARY  
OF THE  
UNIVERSITY OF CALIFORNIA.  
GIFT OF

*Hicks-Judd Co.*

Received *Mar.*, 189*8*.

Accession No. *69780* . Class No. *984m.*

*A735*

*X306*

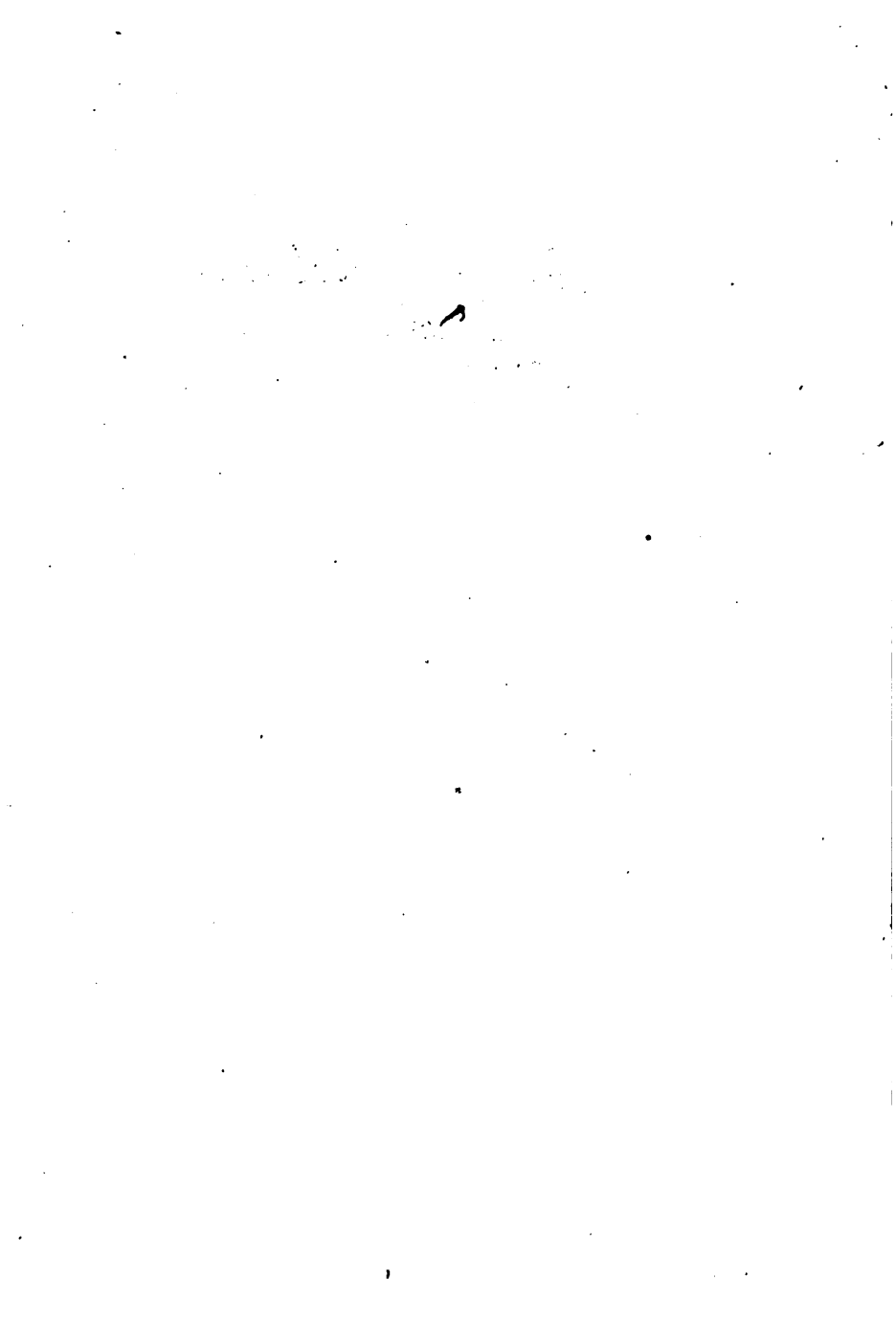
# Sample Book

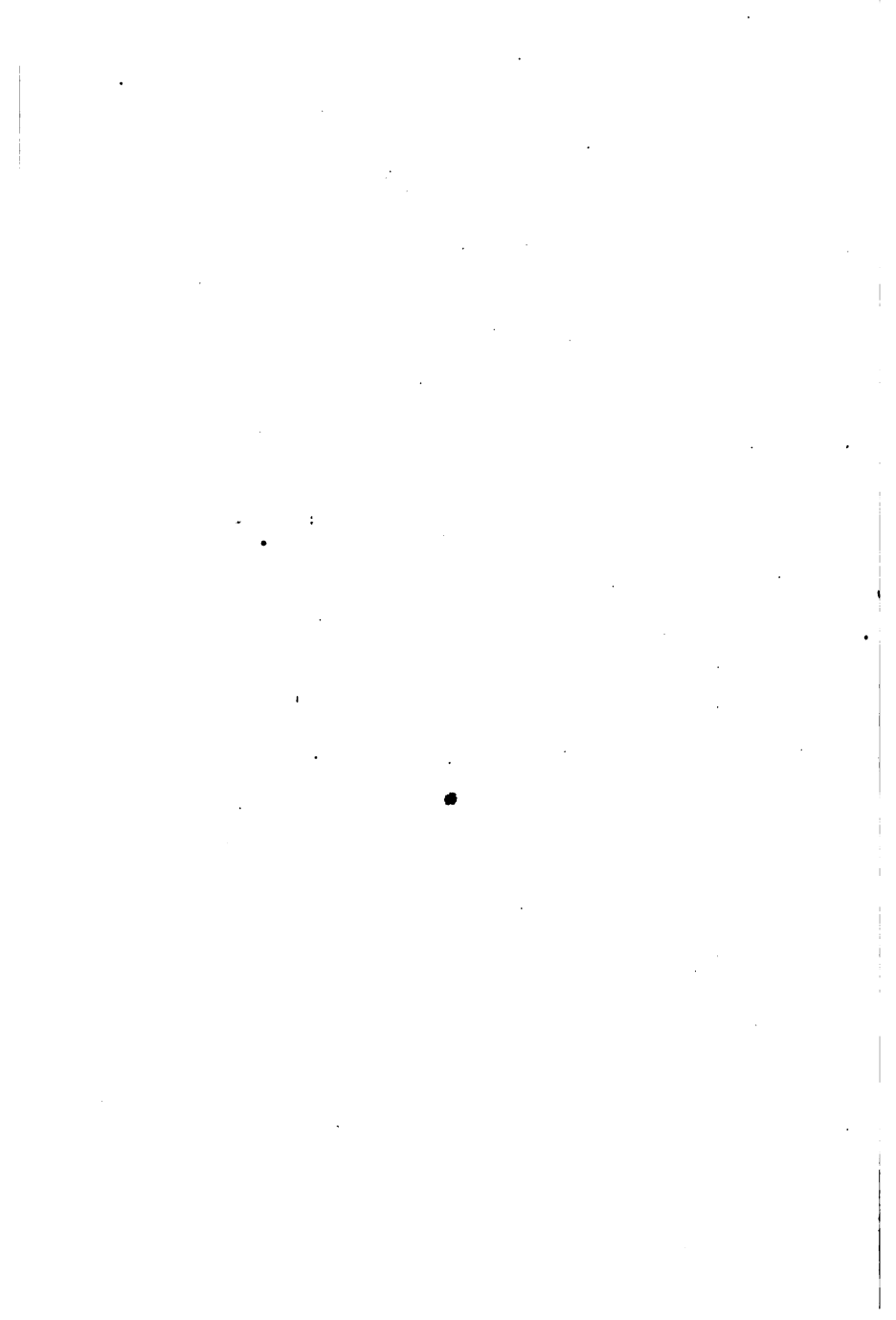
· PROPERTY OF ·

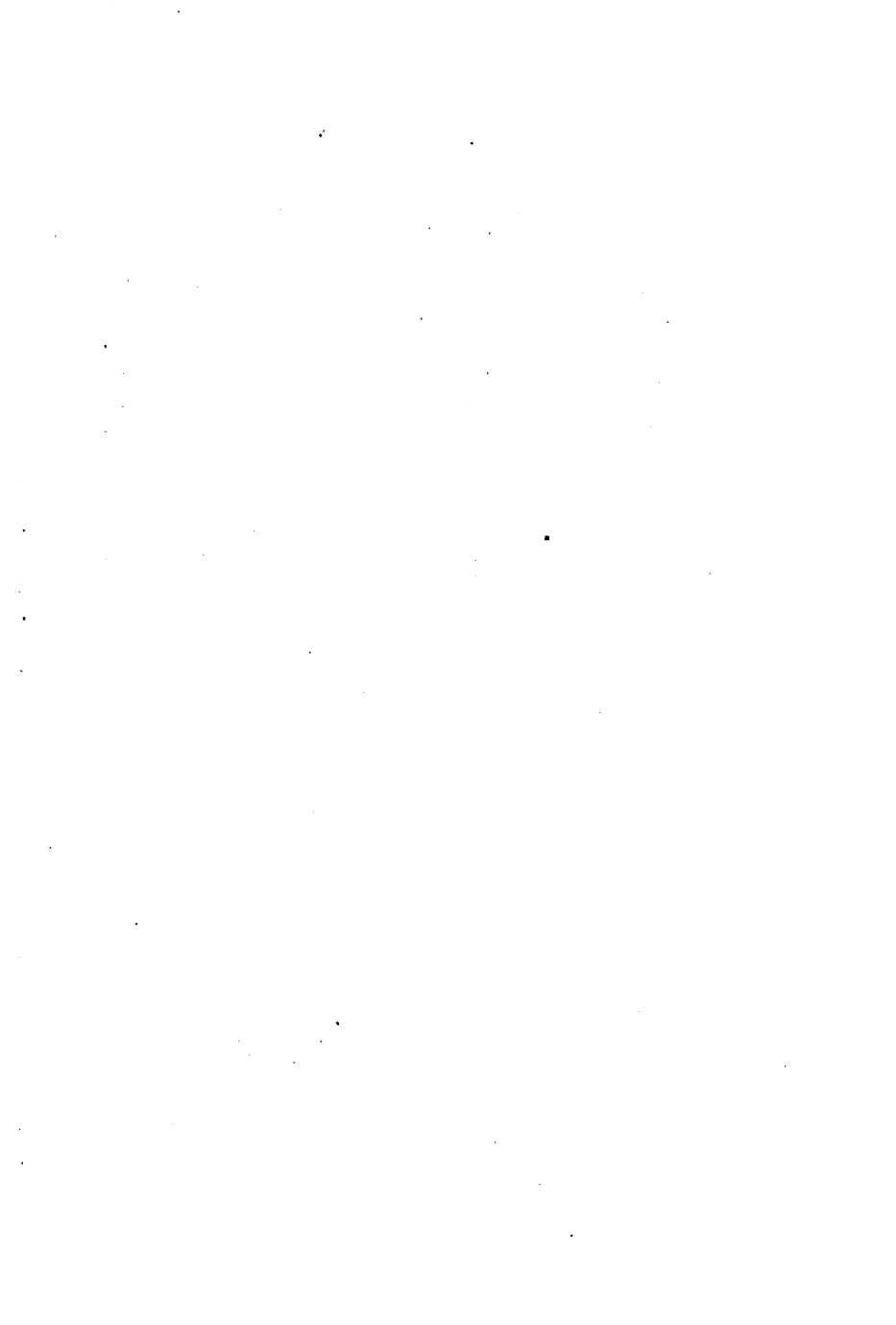
**THE HICKS-JUDD CO.**

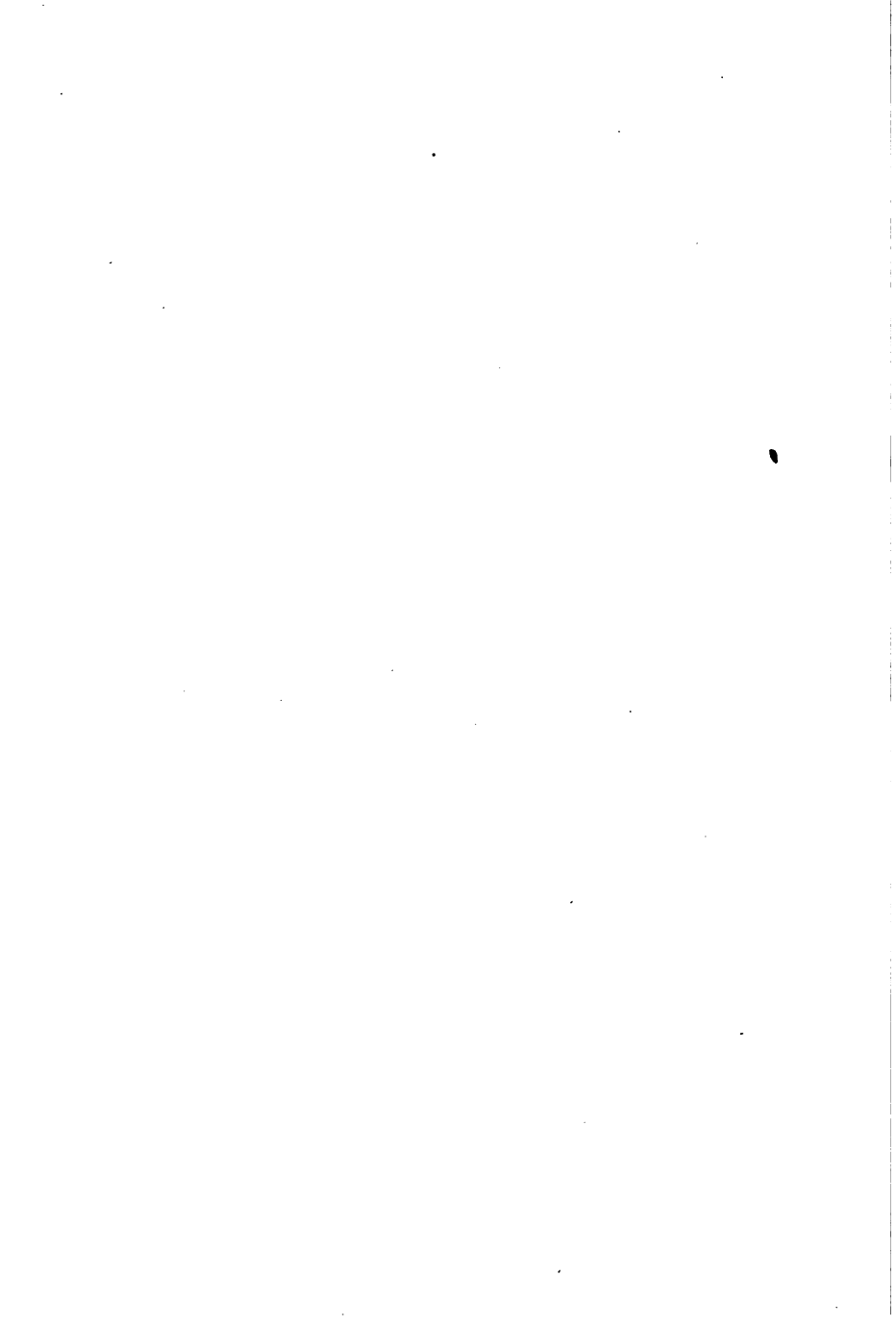
**23 FIRST STREET**

**SAN FRANCISCO**









KEY  
TO THE  
ADVANCED ARITHMETIC  
(California State Series)

Containing full solutions to all of the Examples

WITH AN



APPENDIX

Containing the answers to Fifteen Hundred Examples  
in the

PRIMARY NUMBER LESSONS

PREPARED BY

PROF. A. M. ARMSTRONG, PH. B.

*Principal of the Colusa Commercial and Normal Institute and  
Author of the California Teachers' Examiner*

---

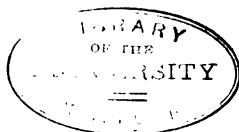
SAN FRANCISCO  
THE BANCROFT COMPANY  
1888



69750

Copyright, 1888

By THE BANCROFT COMPANY



## **PREFACE**

—♦♦—

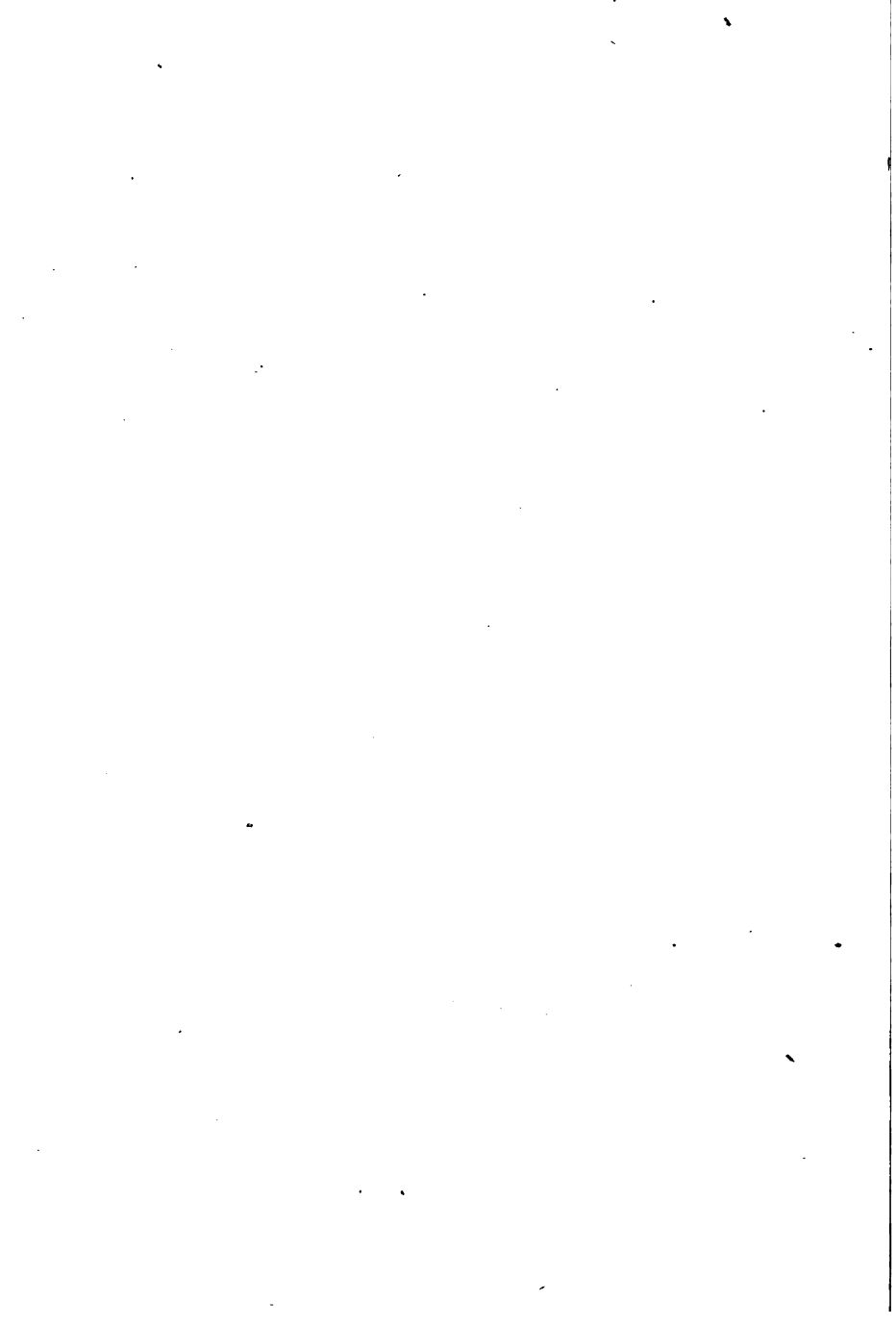
Generally speaking, rules are omitted from the State Series of Arithmetics, and consequently a demand for a guiding "KEY" has arisen. This book is published to supply that want.

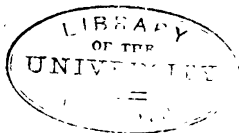
The author does not claim that his methods are in all cases the shortest and the best. With few exceptions, they are the ones naturally followed by his students, and it is his belief that as a rule they represent the solutions that will be used by the average pupil that has been taught "to look for a reason for everything"

The book is open to criticism, and correspondence is invited in order that succeeding editions may contain such alterations as will make the Key truly representative of the arithmetical work of California teachers.

A. M. A.

Colusa, Cal., June 1884.





# KEY

TO

## CALIFORNIA ADVANCED ARITHMETIC

---

### PART I.

## INTEGRAL NUMBERS

---

### PRACTICAL ADDITION AND SUBTRACTION

47. Page 28.

- 1  $4750 - 1287 = 3463$  A.
- 2  $156 + 273 + 195 + 390 + 312 = 1326$  trees
- 3  $83 + 147 = \$230$
- 4  $263 - 197 = 66$  miles
- 5  $31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 30 + 31 + 30 + 31 = 365$  d'ys
- 6  $2500 + 350 + 65 + 119 + 47 = \$3081$
- 7  $21,420 - 16,283 = 5137$  people
- 8  $1885 - 1822 = 63$  years
- 9  $3047 - 2816 = 231$  miles Mo.
- 10  $4617 + 3943 + 3248 + 24,257 + 3308 = 39,373$  votes

- 11  $4617 + 3943 + 3248 + 3308 = 15,116$ ;  $24,257 - 15,116 = 9141$
- 12  $187 + 298 = \$485$  drew;  $2375 - 485 = \$1890$  rem.
- 13  $16,120 + 75,025 = 91,145$  both;  $75,025 - 16,120 = 58,905$  Chinese
- 14  $187 + 153 = 340$ ;  $425 - 340 = 85$  trees
- 15  $212 - 185 = \$27$
- 16  $1799 - 1732 = 67$ ;  $1865 - 1809 = 56$ ;  $67 - 56 = 11$  years, Wash.
- 17  $1276 + 125 = 1401$ ;  $1276 + 1401 + 375 = 3052$ ;  $1276 + 1401 + 3052 = 5729$  Cen. All
- 18  $1852 - 70 = 1782$
- 19  $1483 + 578 + 230 + 1020 = 3311$
- 20  $145 + 65 = \$210$
- 21 Present year - 1850 = *Ans.*
- 22  $309 + 576 = 885$  sum;  $576 - 309 = 267$  Diff;  $885 - 267 = 618$
- 23  $2375 + 450 = \$2825$ ;  $3100 - 2825 = \$275$  gain
- 24  $602 + 1312 + 490 = 2404$  to Chicago;  $2404 + 963 = 3367$  to N. Y.
- 25  $602 + 1312 = 1914$ ;  $490 + 963 = 1453$ .  $1914 - 1453 = 461$  miles
- 26 Present year - 1492 = *Ans.*
- 27  $89,225 + 102,406 + 2960 + 2010 + 356 = 196,957$  votes
- 28  $102,406 - 89,225 = 13,181$  votes
- 29  $89,225 + 2,960 + 2010 + 356 = 94,551$ ;  $102,406 - 94,551 = 7855$
- 30  $17 + 26 + 8 + 18 + 11 + 7 = \$87$ ;  $\$100 - \$87 = \$13$  change
- 31  $173 + 49 = 222$
- 32  $1208 - 749 = 459$
- 33  $970 - 127 = 843$
- 34  $800 + 925 + 1175 = \$2900$ ;  $\$4000 - \$2900 = \$1100$
- 35  $100 - 23 = 77$
- 36  $1728 - 209 = 1519$

- 37 Present Year - 69 = *Ans.*  
38 1922 - birth year = *Ans.*  
39  $2500 + 1550 + 1325 + 725 = \$6100$   
40  $57 + 73 + 61 + 93 + 84 + 101 + 112 = 581$  pupils  
41  $581 - 273 = 308$  girls  
42  $1706 + 84 = 1790$  A. D.  
43  $50,267,519 - 38,567,617 = 11,699,902$  gain  
44  $6608 + 11,591 = 18,199$  mi.;  $11,591 - 6608 = 4983$  miles more  
45  $31 + 28 + 31 + 30 + 31 + 30 = 181$  days  
46  $145 + 25 = 170$  cts.;  $145 - 25 = 120$  cts.;  $170 - 120 = 50$  cts.  
47  $2783 - 1296 = \$1487$   
48  $125 + 125 + 125 = \$375$ ;  $\$375 - \$171 = \$204$  saved  
49  $370 + 370 + 370 + 370 = \$1480$  saved  
50  $1250 + 498 + 726 = 2474$  cen.;  $550 + 1500 = 2050$  cen sold;  $2474 - 2050 = 424$  cen. rem.  
51  $753 + \text{present year} = \text{Ans.}$   
52  $4004 - 1652 = 2352$  B. C.  
53  $29,062 - 14900 = 14162$  feet  
54  $175 + 213 + 94 = 482$  miles  
55  $190 - 45 = \$145$  cost  
56  $125 + 256 + 114 = \$495$  spent;  $1000 - 495 = \$505$  left  
57  $130 + 115 + 58 = 303$  sheep;  $325 + 345 + 203 = \$873$   
58  $2375 + 250 = \$2625$ ;  $2625 - 175 = \$2450$   
59  $\$3400 + 1700 + 1700 + 1500 + 1500 + 1500 = \$11300$   
60  $2114 - 906 = 1208$  drunks  
61  $31 + 30 + 31 + 30 + 31 = 153$  days  
62  $1571 - 753 = 818$  years

- 63  $\$2700 - \$725 = \$1975$   
 64  $30 + 31 + 31 + 30 = 122$  days;  $31 + 28 + 31 + 30 = 120$  days;  
 $122 - 120 = 2$  days  
 65  $1769 + 79 = 1848$  A. D.  
 66  $29,062 + 1317 = 30379$  feet  
 67  $175 - 30 = 145$  cts.;  $145 - 30 = 115$  cts.  
 68  $32 + 32 + 32 + 32 = 128$  trees;  $128 - 72 = 66$  lemon trees

## 65 Page 41

- |                                      |                                      |
|--------------------------------------|--------------------------------------|
| 1 $25 \times \$37 = \$925$           | 8 $960 \times \$75 = \$72,000$       |
| 2 $32 \times 24$ hrs. = 768 hrs.     | 9 $346 \times 65$ lbs. = 22,490 lbs. |
| 3 $11 \times \$16 = \$176$           | 10 $12 \times \$75 = \$900$          |
| 4 $18 \times 5280$ ft. = 95,040 ft.  | 11 $24 \times \$23 = \$552$          |
| 5 $24 \times 23$ miles = 552 miles   | 12 $26 \times 19 = \$494$            |
| 6 $93 \times 104$ trees = 9672 trees | 13 $12 \times \$525 = \$6300$        |
| 7 $35 \times \$33,275 = \$1,164,625$ |                                      |

## 81 Page 54

- |                              |                                    |
|------------------------------|------------------------------------|
| 1 $925 \div 37 = 25$ cows    | 6 $1,164,625 \div 33,275 = 35$ mi. |
| 2 $744 \div 24 = 31$ days    | 7 $72,000 \div 75 = 960$ acres     |
| 3 $176 \div 10 = 11$ months  | 8 $22,490 \div 65 = 346$ chests    |
| 4 $552 \div 23 = 24$ hrs.    | 9 $900 \div 75 = 12$ months        |
| 5 $9672 \div 104 = 93$ acres | 10 $605 \div 55 = 11$ ponies       |

## PRACTICAL MULTIPLICATION AND DIVISION

82 Page

- 1  $50 \times 45 \text{ yds.} = 2250 \text{ yds.}$
- 2  $1728 \div 8 = 216 \text{ T.}$
- 3  $190 \times \$112 = \$21,280$
- 4  $15 \times 320 = 4800 \text{ rods}$
- 5  $11 \times \$31 = \$341 \text{ cost}$
- 6  $1500 \div 14 = 107 \text{ T., } \$2 \text{ rem.}$
- 7  $15 \times 235 = 3525 \text{ lbs.}$
- 8  $19,600 \div 240 = 81, 160 \text{ rem.}$
- 9  $8700 \div 600 = 14\frac{5}{6} \text{ bags}$
- 10  $5 \times 360 = 1800 \text{ eggs}$
- 11  $9785 \div 24 = 407, 17 \text{ rem.}$
- 12  $365 \times 24 = 8760 \text{ hrs.}$
- 13  $850 \times 28 = \$23,800$
- 14  $1974 \div 14 = 141 \text{ calves}$
- 15  $8 \times 3 = 24; 72 \div 24 = 3 \text{ miles}$
- 16  $11 \times 175 = \$1925 \text{ saved}$
- 17  $132,890 \times \$95 = \$12,624,550 \text{ total value}$
- 18  $1,246,453 \div 137 = 9098, 27 \text{ rem.}$
- 19  $3672 \div 297 = 12, 108 \text{ rem.}$
- 20  $365 \times 25 = 9125 \text{ cts. cost}$
- 21  $\$512 \div 64 = \$8; 25 \times \$8 = \$200$
- 22  $4 \text{ wks} \times 7 = 28 \text{ days}; 28 \times 15 = 420 \text{ cts}; 420 \div 10 = 42 \text{ loaves}$
- 23  $15 \times 25 = \$375; 11 \times 95 = \$1045; 50 \times 3 = \$150; \$375 + 1045 + 150 = \$1570$



- 24  $\$1575 \div 15 = \$105$ ;  $\$2750 \div 25 = \$110$ ;  $110 - 105 = \$5$  latter
- 25  $\$295 + 1275 + 96 + 12 + 115 + 60 = \$1853$ ;  $\$2000 - \$1853 = \$147$   
cost of pasture;  $\$147 \div 3 = \$49$  per acre
- 26  $130 \text{ cts.} + 35 + 80 + 75 + 40 = 360 \text{ cts.}$ ;  $360 \text{ cts.} \div 8 = 45 \text{ cts. per roll}$
- 27  $1275 \div 15 = 85 \text{ cts. cost}$ ;  $15 \times 10 = 150 \text{ cts. gain}$ ;  $1275 \text{ cts.} + 150 \text{ cts.} = 1425 \text{ cts., received}$
- 28  $5 \times 20 = \$100$ ;  $\$100 - 95 = \$5$  change
- 29  $50 \text{ cts.} + 300 + 50 = 400 \text{ cts.}$
- 30  $2 \times 37 + 13 = 87$  left;  $87 + 37 = 124$  oranges
- 31  $3675 \div 21 = 175$  bbls.
- 32  $175 \times 265 \text{ lbs.} = 46,375 \text{ lbs.}$
- 33  $4032 \div 14 = 288 \text{ mi. a day}$ ;  $288 \div 24 = 12$  miles an hour
- 34  $35 \times 41 = 1435$  yds.
- 35  $175 \times \$24 = \$4200$  cost;  $4200 - 3500 = \$700$  due
- 36  $4 \times 7 \times \$3 = \$84$  amount
- 37  $4000 - 3879 = 121$ ,  $\times 121 = 14,641$ ,  $+ 1781 = 16,422$ ,  $\div 23 = 711$   
quotient
- 38  $28 - 23 = 5 \text{ mi.}$ ;  $13 \times 5 \text{ mi.} = 65 \text{ mi.}$
- 39  $20 + 29 = 49 \text{ mi. in one day}$ ;  $49 \times 11 = 539 \text{ mi.}$ ;  $600 - 539 = 61 \text{ mi.}$
- 40  $1887 - 1790 = 97 \text{ yrs.}$ ;  $97 \div 10 = 9$  since,  $+ \text{first} = 10$ .
- 41  $1887 - 1789 = 98 \text{ yrs.}$ ;  $98 \div 4 = 24$ ;  $24 + 1 = 25$
- 42  $\$159,175 \div 5 = \$31,835$  average
- 43  $4 \text{ yrs.} \times 365 \text{ days} = 1460 \text{ days}$ ;  $1460 \times 45 = 65,700 \text{ cts.}$ ;  
 $65,700 \div 50 = 1314$  days
- 44  $259,186 \div 312 = 830$  bales, 226 rem.
- 45  $6 \times 24 \times 22 \text{ mi.} = 3168 \text{ mi.}$ ;  $7 \times 24 \times 16 \text{ mi.} = 2688 \text{ mi.}$ ,  $3168 - 2688 = 480 \text{ mi. train}$

- 46  $137 \times \$13 = \$1781$
- 47  $160 \times 2 \times \$11 = \$3520$ ;  $160 \times 16 \times \$1 = \$2560$ ;  $\$3520 + \$2560 = \$6080$  sum;  $\$3520 - \$2560 = \$960$  Diff.
- 48  $8 \times 240 \div 32 = 60$  days
- 49  $2750 \div 50 = 55$  sacks
- 50  $10 \times \$125 \div \$10 = 125$  cd.
- 51  $11,984 \div 107 = 112$  trees
- 52  $12 \times 12 = 144$  days
- 53  $375 \div 1 = 375$  boxes
- 54  $84 \times 750 = 63,000$  oranges;  $63,000 \div 12 = 5250$  doz.
- 55  $5250 \times 12$  cts. = 63,000 cts.
- 56  $12 \times 16 \div 6 = 32$  days
- 57  $125 \times \$6 = \$750$ ;  $25 \times \$4 = \$100$ ;  $\$750 + \$100 - \$750 = \$100$  gain
- 58  $1000 \div 65 = 15$ , \$25 rem;  $25 \div 5 = 5$  rings
- 59  $\$120 - \$60 = \$65$  saved in one mo.;  $1920 \div 60 = 32$  mo.
- 60  $\$22 + \$42 = \$64$ ;  $12 \times 64 = \$768$  one year's expenses;  $\$1500 - \$768 = \$732$ ,  $\times 4 = \$2928$  saved
- 61  $24 \times \$2 = \$48 + \$175 = \$223$  cost;  $\$225 - \$223 = \$2$  gain
- 62  $70 - 21 = 49$  yrs.;  $49 \times 12 \times \$15 = \$8820$
- 63  $\$50,000 \div 12 = \$4166\frac{2}{3}$ ;  $50,000 \times 4 = \$200,000$
- 64  $1974 \div 141 = \$14$
- 65  $450 \div 150 = \$3$  gain on each;  $\$14 + \$3 = \$17$  S. P. per head
- 66  $\$85 + 95 + 105 + 115 + 120 = \$520$ ;  $\$520 \div 5 = \$104$  average value
- 67  $365 \times \$3 = \$1095$ ;  $\$1750 - \$1095 = \$655$  saved
- 68  $\$1955 \div 23 = \$85$  cost of one A;  $33 \times \$85 = \$2805$  total cost
- 69  $\$20 - \$2 = \$18$ ;  $\$432 \div \$18 = 24$  watches
- 70  $200 + 375 = 575$ ;  $784 - 575 = 209$  rem.;  $209 \times \$2 = \$418$

- 71  $320 - (160 + 80) = 80$  A.;  $160 \times \$125 = \$20,000$ ;  $80 \times \$75 = \$6000$   
 $30,000 - (20,000 + 6000) = \$4000, \div 80 = \$50$  per acre
- 72  $31 \times \$3 = \$93$ ;  $\$80 + \$15 = \$95$ ;  $\$95 - \$93 = \$2$  change
- 73  $15 \times 38 \times \$4 = \$2280$
- 74  $\$195 + 210 + 255 + 300 = \$960$ ;  $960 \div 4 = \$240$  average value
- 75  $63 \times 231 = 14,553$  cu. in.
- 76  $11 + 4 - 8 = 7$  tons;  $7 \times \$45 = \$315$
- 77  $\$2160 \div 12 = \$180$  S. P. each
- 78  $\$105 \div 35 = \$3$  for one yard;  $25 \times \$3 = \$75$
- 79  $32 + 42 = 74$  yds.;  $\$296 \div 74 = \$4$  average per yard
- 80  $94 + 2 = 96$ ;  $96 \div 4 = 24$  marbles
- 81  $4 \times 7 = 28$  da.,  $\times 15 \div 60 \times 10$  cts = 70 cts.
- 82  $1755 \div 39 = 45$  yrs.
- 83  $135 \times 25 \div 15 = 225$  lbs.
- 84  $4 \times 65 = 260$  scholars;  $260 - 105 = 155$  girls
- 85  $105 \times 2 = 210$  rds.;  $108 \times 2 = 216$  rds.;  $210 + 216 = 426$  rds.
- 86  $148 \times 2 = 296$  steps
- 87  $11 \times 15 \div 5 = 33$  days
- 88  $\$1665 - \$1530 = \$135$ ,  $\$135 \div 9 = \$15$  gain on each

---

## GREATEST COMMON DIVISOR

86 Page 66

$$\begin{array}{r}
 1 \quad 24 = 2, 2, 2, 3 \\
 36 = 2, 2, 3, 3 \\
 42 = 2, 3, 7 \\
 \hline
 \end{array}$$

$2 \times 3 = 6$  G. C. D.

$$\begin{array}{r}
 2 \quad 33 = 3, 11 \\
 44 = 2, 2, 11 \\
 77 = 7, 11 \\
 187 = 11, 17 \\
 \hline
 \end{array}$$

$11$  G. C. D.

$$\begin{array}{r}
 3 \quad 120=2, 2, 2, 3, 5 \\
 144=2, 2, 2, 2, 3, 3 \\
 216=2, 2, 2, 3, 3, 3 \\
 \hline
 2 \times 2 \times 2 \times 3 = 24 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 4 \quad 135=3, 3, 3, 5 \\
 180=2, 2, 3, 3, 5 \\
 90=3, 3, 2, 5 \\
 \hline
 3 \times 3 \times 5 = 45 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 5 \quad 108=2, 2, 3, 3, 3 \\
 45=3, 3, 5 \\
 81=3, 3, 3, 3 \\
 \hline
 3 \times 3 = 9 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 6 \quad 85=5, 17 \\
 95=5, 19 \\
 \hline
 5 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 7 \quad 72=2, 2, 2, 3, 3 \\
 168=2, 2, 2, 3, 7 \\
 \hline
 2 \times 2 \times 2 \times 3 = 24 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 8 \quad 119=7, 7 \\
 132=2, 2, 3, 11 \\
 \hline
 \text{No C. D.}
 \end{array}$$

$$\begin{array}{r}
 9 \quad 24=2, 2, 2, 3 \\
 33=3, 11 \\
 120=2, 2, 2, 3, 5 \\
 \hline
 3 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 10 \quad 36=2, 2, 3, 3 \\
 44=2, 2, 11 \\
 144=2, 2, 2, 2, 3, 3 \\
 \hline
 2 \times 2 = 4 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 11 \quad 105=3, 5, 7 \\
 120=2, 2, 2, 3, 5 \\
 135=3, 3, 3, 5 \\
 \hline
 3 \times 5 = 15 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 12 \quad 144=2, 2, 2, 2, 3, 3 \\
 180=2, 2, 3, 3, 5 \\
 \hline
 2 \times 2 \times 3 \times 3 = 36 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 13 \quad 105=3, 5, 7 \\
 140=2, 2, 5, 7 \\
 175=5, 5, 7 \\
 \hline
 5 \times 7 = 35 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 14 \quad 99=3, 3, 11 \\
 180=2, 2, 3, 3, 5 \\
 252=3, 3, 2, 2, 7 \\
 \hline
 3 \times 3 = 9 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 15 \quad 132=2, 2, 3, 11 \\
 154=2, 7, 11 \\
 165=3, 5, 11 \\
 \hline
 11 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 16 \quad 60=10, 2, 3 \\
 80=10, 2, 2, 2 \\
 100=10, 2, 5 \\
 120=10, 2, 2, 3 \\
 \hline
 10 \times 2 = 20 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{l}
 17 \quad 864=2, 2, 2, 2, 3, 3, 3 \\
 \quad 420=2, 2, 3, 5, 7 \\
 \quad 600=2, 2, 2, 3, 5, 5 \\
 \hline
 \quad 2 \times 2 \times 3 = 12 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{l}
 18 \quad 75=3, 5, 5 \\
 \quad 105=3, 5, 7 \\
 \quad 120=2, 2, 2, 3, 5 \\
 \hline
 \quad 3 \times 5 = 15 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{l}
 19 \quad 108=2, 2, 3, 3, 3 \\
 \quad 252=2, 2, 3, 3, 7 \\
 \hline
 \quad 2 \times 2 \times 3 \times 3 = 36 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{l}
 20 \quad 39=3, 13 \\
 \quad 52=2, 2, 13 \\
 \quad 65=5, 13 \\
 \hline
 \quad 13 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{l}
 21 \quad 84=2, 2, 3, 7 \\
 \quad 132=2, 2, 3, 11 \\
 \hline
 \quad 2 \times 2 \times 3 = 12 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{l}
 22 \quad 168=2, 2, 2, 3, 7 \\
 \quad 539=7, 7, 11 \\
 \hline
 \quad 7 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{l}
 23 \quad 112=2, 2, 2, 2, 7 \\
 \quad 147=3, 7, 7 \\
 \quad 168=2, 2, 2, 3, 7 \\
 \hline
 \quad 7 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{l}
 24 \quad 287=7, 41 \\
 \quad 369=3, 3, 41 \\
 \hline
 \quad 41 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{l}
 25 \quad 55=5, 11 \\
 \quad 110=2, 5, 11 \\
 \hline
 \quad 5 \times 11 = 55 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{l}
 26 \quad 81=3, 3, 3, 3 \\
 \quad 120=2, 2, 2, 3, 5 \\
 \quad 141=3, 47 \\
 \hline
 \quad 3 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{l}
 27 \quad 78=2, 3, 13 \\
 \quad 169=13, 13 \\
 \quad 130=2, 5, 13 \\
 \hline
 \quad 13 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{l}
 28 \quad 150=10, 3, 5 \\
 \quad 210=10, 3, 7 \\
 \quad 330=10, 3, 11 \\
 \hline
 \quad 10 \times 3 = 30 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{l}
 29 \quad 99=3, 3, 11 \\
 \quad 132=2, 2, 3, 11 \\
 \hline
 \quad 3 \times 11 = 33 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{l}
 30 \quad 120=2, 2, 2, 3, 5 \\
 \quad 165=3, 5, 11 \\
 \hline
 \quad 3 \times 5 = 15 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{l}
 31 \quad 120=2, 2, 2, 3, 5 \\
 \quad 252=2, 2, 3, 3, 7 \\
 \hline
 \quad 2 \times 2 \times 3 = 12 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{l}
 32 \quad 85=5, 17 \\
 \quad 102=2, 3, 17 \\
 \hline
 \quad 17 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 33 \quad 42=2, 3, 7 \\
 77=7, 11, \\
 91=7, 13 \\
 \hline
 7 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 34 \quad 34=2, 17 \\
 44=2, 2, 11 \\
 \hline
 2 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 35 \quad 28=2, 2, 7 \\
 98=2, 7, 7 \\
 \hline
 2 \times 7 = 14 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 36 \quad 110=10, 11 \\
 210=10, 3, 7 \\
 \hline
 10 \text{ G. C. D.}
 \end{array}$$

## 88 Page 66

$$\begin{array}{r}
 1 \quad 135=3, 3, 3, 5 \\
 270=2, 3, 3, 3, 5 \\
 \hline
 3 \times 3 \times 3 \times 5 = 135 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 2 \quad 207=3, 3, 23 \\
 1017=3, 3, 113 \\
 \hline
 3 \times 3 = 9 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 3 \quad 702=2, 3, 3, 3, 13 \\
 4706=2, 13, 181 \\
 \hline
 2 \times 13 = 26 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 4 \quad 3003=3, 7, 11, 13 \\
 11,011=11, 7, 11, 13 \\
 \hline
 7 \times 11 \times 13 = 1001 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 5 \quad 725=5, 5, 29 \\
 4350=2, 3, 5, 5, 29 \\
 \hline
 5 \times 5 \times 29 = 725 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 6 \quad 87=3, 29 \\
 203=7, 29 \\
 \hline
 29 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 7 \quad 750=2, 3, 5, 5, 5 \\
 129=3, 43 \\
 \hline
 3 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 8 \quad 597=3, 199 \\
 237=3, 79 \\
 \hline
 3 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 9 \quad 975=3, 5, 5, 13 \\
 555=3, 5, 37 \\
 \hline
 3 \times 5 = 15 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 10 \quad 510=2, 3, 5, 17 \\
 714=2, 3, 7, 17 \\
 \hline
 2 \times 3 \times 17 = 102 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 11 \quad 378=2, 3, 3, 3, 7 \\
 1818=2, 3, 3, 101 \\
 \hline
 2 \times 3 \times 3 = 18 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 12 \quad 1011=3, 337 \\
 1101=3, 367 \\
 \hline
 3 \text{ G. C. D.}
 \end{array}$$

$$13 \quad 246=2, 3, 41$$

$$438=2, 3, 73$$

$$2 \times 3 = 6 \text{ G. C. D.}$$

$$14 \quad 720=2, 2, 2, 2, 3, 3, 5$$

$$256=2, 2, 2, 2, 2, 2, 2$$

$$2 \times 2 \times 2 \times 2 = 16 \text{ G. C. D.}$$

$$15 \quad 981=3, 3, 109$$

$$711=3, 3, 79$$

$$3 \times 3 = 9 \text{ G. C. D.}$$

$$16 \quad 846=2, 3, 3, 47$$

$$329=7, 47$$

$$47 \text{ G. C. D.}$$

$$17 \quad 279=3, 3, 31$$

$$496=2, 2, 2, 2, 31$$

$$31 \text{ G. C. D.}$$

$$18 \quad 213=3, 71$$

$$284=2, 2, 71$$

$$71 \text{ G. C. D.}$$

$$135=3, 3, 3, 5$$

$$270=2, 3, 3, 3, 5$$

$$207=3, 3, 23$$

$$1017=3, 3, 113$$

$$3 \times 3 = 9 \text{ G. C. D.}$$

$$b \quad 702=2, 3, 3, 3, 13$$

$$4706=2, 13, 181$$

$$3003=3, 7, 11, 13$$

$$11011=11, 7, 11, 13$$

$$13 \text{ G. C. D.}$$

$$c \quad 725=5, 5, 29$$

$$4350=2, 3, 5, 5, 29$$

$$87=3, 29$$

$$203=7, 29$$

$$29 \text{ G. C. D.}$$

$$d \quad 750=3, 2, 5, 5, 5$$

$$129=3, 43$$

$$597=3, 199$$

$$237=3, 79$$

$$3 \text{ G. C. D.}$$

$$e \quad 975=3, 5, 5, 13$$

$$555=3, 5, 37$$

$$510=2, 3, 5, 17$$

$$714=2, 3, 7, 17$$

$$3 \text{ G. C. D.}$$

$$f \quad 378=2, 3, 3, 3, 7$$

$$1818=2, 3, 3, 101$$

$$1011=3, 337$$

$$1101=3, 367$$

$$3 \text{ G. C. D.}$$

$$\begin{array}{r}
 g \quad 246=2, 3, 4 \\
 438=2, 3, 73 \\
 720=2, 2, 2, 2, 3, 3, 5 \\
 256=2, 2, 2, 2, 2, 2, 2, 2 \\
 \hline
 2 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 h \quad 981=3, 3, 109 \\
 711=3, 3, 79 \\
 846=2, 3, 3, 47 \\
 329=7, 47 \\
 \hline
 \text{No C. D.}
 \end{array}$$

89 Page 67

$$\begin{array}{r}
 1 \quad \begin{array}{r} 539 \overline{)168} \\ 504 \quad (3 \\ \hline 168 \overline{)35} \\ 140 \quad (4 \\ \hline 35 \overline{)28} \\ 28 \quad (1 \\ \hline 28 \overline{)7} \text{ G.C. D.} \\ 28 \quad (4 \end{array}
 \end{array}$$

$$\begin{array}{r}
 2 \quad \begin{array}{r} 168 \overline{)147} \\ 147 \quad (1 \\ \hline 147 \overline{)21} \text{ G.C.D} \\ 147 \quad (7 \end{array}
 \end{array}$$

$$\begin{array}{r}
 3 \quad \begin{array}{r} 369 \overline{)287} \\ 287 \quad (1 \\ \hline 287 \overline{)82} \\ 246 \quad (3 \\ \hline 82 \overline{)41} \text{ G. C. D.} \\ 82 \quad (2 \end{array}
 \end{array}$$

$$\begin{array}{r}
 4 \quad \begin{array}{r} 169 \overline{)78} \\ 156 \quad (2 \\ \hline 78 \overline{)13} \text{ G.C.D.} \\ 78 \quad (6 \end{array}
 \end{array}$$

$$\begin{array}{r}
 5 \quad \begin{array}{r} 636 \overline{)371} \\ 371 \quad (1 \\ \hline 371 \overline{)265} \\ 265 \quad (1 \\ \hline 265 \overline{)106} \\ 212 \quad (2 \\ \hline 106 \overline{)53} \text{ G. C. D.} \\ 106 \quad (2 \end{array}
 \end{array}$$

$$\begin{array}{r}
 6 \quad \begin{array}{r} 961 \overline{)279} \\ 837 \quad (3 \\ \hline 279 \overline{)124} \\ 248 \quad (2 \\ \hline 124 \overline{)31} \text{ G. C. D.} \\ 124 \quad (4 \end{array}
 \end{array}$$



## LEAST COMMON MULTIPLE

90 Page 68

$$\begin{array}{r|rrr}
 1 & 5 & 30 & 45 & 90 \\
 3 & & 6 & 9 & 18 \\
 3 & & 2 & 3 & 6 \\
 2 & & 2 & & 2 \\
 \hline
 & & & & =90
 \end{array}$$

$$\begin{array}{r|rrr}
 2 \times 3 & 24 & 36 & 42 \\
 2 & 4 & 6 & 7 \\
 \hline
 & 2 & 3 & 7 = 504
 \end{array}$$

$$\begin{array}{r|rrrr}
 3 & 2 & 4 & 8 & 10 & 5 \\
 2 & & 2 & 4 & 5 & 5 \\
 5 & & 2 & 5 & 5 & \\
 \hline
 & 2 & & & & =40
 \end{array}$$

$$\begin{array}{r|rrrr}
 4 & 5 & 5 & 12 & 15 & 30 \\
 3 & & 12 & 3 & 6 & \\
 2 & & 4 & & 2 & \\
 \hline
 & 2 & & & & =60
 \end{array}$$

$$\begin{array}{r|rrrr}
 5 & 2 & 7 & 12 & 18 & 24 \\
 3 & & 7 & 6 & 9 & 12 \\
 2 & & 7 & 2 & 3 & 4 \\
 \hline
 & 7 & & 3 & 2 = 504
 \end{array}$$

$$\begin{array}{r|rr}
 6 & 5 \times 5 & 75 & 100 \\
 & 3 & 4 = 300
 \end{array}$$

$$\begin{array}{r|rrr}
 7 & 2 \times 5 & 20 & 30 & 40 \\
 & 2 & 2 & 3 & 4 \\
 \hline
 & 3 & 2 = 120
 \end{array}$$

$$\begin{array}{r|rrr}
 8 & 11 & 33 & 44 & 21 \\
 & & 3 & 4 & 7 = 924
 \end{array}$$

$$\begin{array}{r|rr}
 9 & 5 & 105 & 120 \\
 3 & & 21 & 24 \\
 \hline
 & 7 & 8 = 840
 \end{array}$$

$$\begin{array}{r|rrr}
 10 & 3 & 18 & 27 & 12 \\
 3 & & 6 & 9 & 4 \\
 2 & & 2 & 3 & 4 \\
 \hline
 & 3 & 2 = 108
 \end{array}$$

$$\begin{array}{r|rrr}
 11 & 7 & 14 & 21 & 15 \\
 3 & & 2 & 3 & 15 \\
 \hline
 & 2 & & 5 = 210
 \end{array}$$

$$\begin{array}{r|rrrrr}
 12 & 3 & 3 & 4 & 5 & 6 & 10 \\
 2 & & 4 & 5 & 2 & 10 & \\
 5 & & 2 & 5 & & 5 & \\
 \hline
 & 2 & & & & =60
 \end{array}$$

$$\begin{array}{r|rrrrr}
 13 & 2 \times 3 & 12 & 18 & 24 & 36 & 72 \\
 2 & & 2 & 3 & 4 & 6 & 12 \\
 3 & & 3 & 2 & 3 & 6 & \\
 2 & & 2 & & 2 & & \\
 \hline
 & & & & & =72
 \end{array}$$

$$\begin{array}{r|rrrr}
 14 & 2 \times 2 & 12 & 16 & 20 & 24 \\
 3 & & 3 & 4 & 5 & 6 \\
 2 & & 4 & 5 & 2 & \\
 \hline
 & 2 & 5 = 240
 \end{array}$$

$$\begin{array}{r|rrr} 15 & 7 & 28 & 2 & 35 \\ & 2 & 4 & 6 & 5 \\ \hline & & 2 & 3 & 5=420 \end{array}$$

$$\begin{array}{r|rrr} 16 & 5 \times 5 & 50 & 75 & 125 \\ & & 2 & 3 & 5=750 \end{array}$$

$$\begin{array}{r|rrr} 17 & 2 & 9 & 10 & 12 \\ & 3 & 9 & 5 & 6 \\ \hline & & 3 & 5 & 2=180 \end{array}$$

$$\begin{array}{r|rrrr} 18 & 3 & 24 & 30 & 36 & 40 \\ & 2 & 8 & 10 & 12 & 40 \\ & 2 & 4 & 5 & 6 & 20 \\ & 2 & 2 & 5 & 3 & 10 \\ & 5 & & 5 & 3 & 5 \\ \hline & & & 3 & & =360 \end{array}$$

$$\begin{array}{r|rrrr} 19 & 2, 2, 3 & 108 & 132 & 144 \\ & 3 & 9 & 1 & 12 \\ \hline & & 3 & 11 & 4=4752 \end{array}$$

$$\begin{array}{r|rrrr} 20 & 7 & 7 & 11 & 14 & 21 \\ & & 11 & 2 & 3=462 \end{array}$$

$$\begin{array}{r|rrrr} 21 & 2, 2, 3 & 72 & 84 & 132 \\ & & 6 & 7 & 11=5544 \end{array}$$

$$\begin{array}{r|rrrr} 22 & 3 & 75 & 105 & 120 \\ & 5 & 25 & 35 & 40 \\ \hline & & 5 & 7 & 8=4200 \end{array}$$

$$\begin{array}{r|rrrr} 23 & 2 & 30 & 42 & 126 \\ & 3 & 15 & 21 & 63 \\ & 7 & 5 & 7 & 21 \\ \hline & & 5 & & 3=630 \end{array}$$

$$\begin{array}{r|rrrr} 24 & 2, 5 & 120 & 140 & 210 \\ & 7 & 12 & 14 & 21 \\ & 2 & 12 & 2 & 3 \\ & 3 & 6 & & 3 \\ \hline & & 2 & & =840 \end{array}$$

$$\begin{array}{r|rrrr} 25 & 5 & 15 & 21 & 35 \\ & 3 & 3 & 21 & 7 \\ & 7 & & 7 & 7 \\ \hline & & & & =105 \end{array}$$

$$\begin{array}{r|rrrr} 26 & 19 & 38 & 57 & 95 \\ & & 2 & 3 & 5=570 \end{array}$$

$$\begin{array}{r|rrrr} 27 & 3, 3 & 18 & 27 & 36 \\ & 2 & 2 & 3 & 4 \\ \hline & & 3 & 2 & =108 \end{array}$$

$$\begin{array}{r|rrrr} 28 & 13 & 26 & 39 & 65 \\ & & 2 & 3 & 5=390 \end{array}$$

$$\begin{array}{r|rrrr} 29 & 11 & 33 & 44 & 55 \\ & & 3 & 4 & 5=660 \end{array}$$

$$\begin{array}{r|rrrr} 30 & 12 & 84 & 96 \\ & & 7 & 8=672 \end{array}$$

$$31 \quad 12 \quad 13=156$$

$$32 \quad 13 \quad 16=208$$

$$\begin{array}{r|rrrr} 33 & 5 & 23 & 25 & 30 \\ & & 23 & 5 & 6=3450 \end{array}$$

$$34 \quad 9 \cdot 11 = 99$$

$$35 \quad 2 \mid \begin{array}{cc} 24 & 26 \\ \hline 12 & 13 = 312 \end{array}$$

$$36 \quad 24 \cdot 25 = 600$$

$$37 \quad 2.2 \mid \begin{array}{cc} 64 & 84 \\ \hline 16 & 21 = 1344 \end{array}$$

$$38 \quad 2 \mid \begin{array}{cc} 34 & 36 \\ \hline 17 & 18 = 612 \end{array}$$

$$39 \quad 2.3 \mid \begin{array}{ccc} 17 & 18 & 30 \\ \hline 17 & 3 & 5 = 1530 \end{array}$$

## 92 Page 69

$$1 \quad 189(105 \quad 21)105 \\ \begin{array}{cc} 105 \overline{)1} & 5 \times 189 = 945 \\ \hline 84 = 2, 2, 21 \end{array}$$

$$2 \quad 169(91 \quad 13)91 \\ \begin{array}{cc} 91 \overline{)1} & 7 \times 169 = 1183 \\ \hline 78 = 2, 3, 13 \end{array}$$

$$3 \quad 169(78 \quad 13)78 \\ \begin{array}{cc} 156 \overline{)2} & 6 \times 169 = 1014 \\ \hline 13 \end{array}$$

$$4 \quad 132 \times 119 = 15708$$

$$5 \quad 539(168 \quad 7)168 \\ \begin{array}{cc} 504 \overline{)3} & 24 \times 539 = \\ \hline 35 = 5 \times 7 & 12936 \end{array}$$

$$6 \quad 369(287 \quad 41)287 \\ \begin{array}{cc} 287 \overline{)1} & 7 \times 369 = \\ \hline 82 = 2 \times 41 & 2583 \end{array}$$

$$7 \quad 168(147 \quad 21)147 \\ \begin{array}{cc} 147 \overline{)1} & 7 \times 168 = \\ \hline 21 & 1176 \end{array}$$

$$8 \quad 279(124 \quad 31)124 \\ \begin{array}{cc} 248 \overline{)2} & 4 \times 279 = 1116 \\ \hline 31 \end{array}$$

$$9 \quad 21(15 \quad 3)15 \\ \begin{array}{cc} 15 \overline{)1} & 5 \times 21 = 105 \\ \hline 6 = 2, 3 \end{array}$$

$$10 \quad 28(21 \quad 7)21 \\ \begin{array}{cc} 21 \overline{)2} & 3 \times 28 = 84 \\ \hline 7 \end{array}$$

$$11 \quad 20(16 \quad 4)16 \\ \begin{array}{cc} 16 \overline{)1} & 4 \times 20 = 80 \\ \hline 4 \end{array}$$

$$12 \quad 45(40 \quad 5)40 \\ \begin{array}{cc} 40 \overline{)1} & 8 \times 45 = 360 \\ \hline 5 \end{array}$$

$$13 \quad 45(36 \quad 9)36 \\ \begin{array}{cc} 36 \overline{)1} & 4 \times 45 = \\ \hline 9 & 180 \end{array}$$

$$14 \quad 54(36 \quad 18)36 \\ \begin{array}{cc} 36 \overline{)1} & 2 \times 54 = \\ \hline 18 & 108 \end{array}$$

15  $32 \ 16=32$

$$\begin{array}{r}
 16 \quad 81(63) \quad 9)63 \\
 \underline{63 \ (1)} \quad 7 \times 81 = 567 \\
 18 = 2, 9
 \end{array}$$

$$\begin{array}{r}
 17 \quad 64(56) \quad 8)56 \\
 \underline{56 \ (1)} \quad 7 \times 64 = 448 \\
 8
 \end{array}$$

$$\begin{array}{r}
 18 \quad 44(33) \quad 11)33 \\
 \underline{33 \ (1)} \quad 3 \times 44 = 132 \\
 11
 \end{array}$$

$$\begin{array}{r}
 19 \quad 1017(207) \quad 9)207 \\
 \underline{828 \ (4)} \quad 23 \times 1017 = \\
 189 = 3, 3, 3, 7 \quad 23391
 \end{array}$$

$$\begin{array}{r}
 20 \quad 11011(3003) \\
 \underline{9009 \ (3)} \\
 2002 = 2, 1001 \\
 1001)3003 \\
 \underline{3 \times 11011 = 33033}
 \end{array}$$

$$\begin{array}{r}
 21 \quad 203(81) \quad 29)87 \\
 \underline{174 \ (2)} \quad 3 \times 203 = 609 \\
 29
 \end{array}$$

$$\begin{array}{r}
 22 \quad 750(129) \quad 3)129 \\
 \underline{645 \ (5)} \quad 43 \times 750 = \\
 105 = 3, 3, 3, 5 \quad 32250
 \end{array}$$

$$\begin{array}{r}
 23 \quad 1818(378) \quad 18)378 \\
 \underline{1512 \ (4)} \quad 21 \times 1818 = \\
 306 = 3, 3, 2, 17 \quad 38178
 \end{array}$$

$$\begin{array}{r}
 24 \quad 981(711) \quad 9)711 \\
 \underline{711 \ (1)} \quad 79 \times 981 = \\
 270 = 10, 3, 3, 3 \quad 77499
 \end{array}$$

$$\begin{array}{r}
 25 \quad 846(329) \quad 47)329 \\
 \underline{658 \ (2)} \quad 7 \times 846 = \\
 188 = 2, 2, 47 \quad 5922
 \end{array}$$

## PRACTICAL FACTORING.

94 Page 70

$$\begin{array}{r}
 1 \quad 15 = 3, 5 \\
 18 = 3, 3, 2 \\
 \hline
 3 \text{ G. C. D.}
 \end{array}$$

$$\begin{array}{r}
 2 \quad 120 = 2, 2, 2, 3, 5 \\
 128 = 2, 2, 2, 2, 2, 2, 2 \\
 144 = 2, 2, 2, 2, 3, 3 \\
 \hline
 2, 2, 2 = 8 \text{ ft.}
 \end{array}$$

3  $3, 4, 5 = 60 \text{ miles.}$

$$\begin{array}{r}
 4 \quad 360 = 5, 2, 3, 3, 4 \\
 480 = 5, 2, 3, 4, 4 \\
 \hline
 5, 2, 3, 4 = 120 \text{ ft.} \\
 360 + 480 = 840 \div 120 = 71.
 \end{array}$$

$$\begin{array}{r}
 5 \quad 5 \overline{) 20 \ 15} \\
 \underline{4 \ 3} = 60 \text{ min.} \\
 60 \div 15 = 4 \times 80 \text{ rds.} = 320 \text{ rds.} \\
 60 \div 20 = 3 \times 80 \text{ rds.} = 240 \text{ rds.}
 \end{array}$$

$$\begin{array}{r} 6 \quad 2 \overline{) 4, 6, 8, 10} \\ 2 \overline{) 2, 3, 4, 5} \\ \hline 3, 2, 5 = 120 \text{ qts.} \end{array}$$

$$\begin{array}{r} 7 \quad 525 = 5, 7, 3, 5 \\ 945 = 5, 7, 3, 3, 3 \\ \hline 5, 7, 3 = 105 \text{ lbs.} \\ 525 \div 105 = 5 \text{ bags} \times \$2 = \\ \quad \$10 \text{ barley.} \\ 945 \div 105 = 9 \text{ bags} \times \$2 = \\ \quad \$18 \text{ wheat.} \end{array}$$

$$\begin{array}{r} 8 \quad 2 \overline{) 5, 6, 7, 8, 10} \\ 5 \overline{) 5, 3, 7, 4, 5} \\ \hline 3, 7, 4 = 840 \text{ cts.} \end{array}$$

$$\begin{array}{r} 9 \quad 5 \overline{) 2, 3, 5, 10} \\ 2 \overline{) 2, 3, 2} \\ \hline 3 = 30 \text{ cts.} \times 4 = \\ \quad 120 \text{ cts.} \end{array}$$

$$\begin{array}{r} 10 \quad 112 = 2, 2, 2, 2, 7 \\ 140 = 2, 2, 5, 7 \\ \hline 2, 2, 7 = 28 \text{ each.} \end{array}$$

$$\begin{array}{r} 11 \quad 3 \overline{) 7 \quad 9 \quad 12} \\ 7 \quad 3 \quad 4 = 252 \text{ nuts} \end{array}$$

$$\begin{array}{r} 12 \quad 3 \overline{) 3 \quad 4 \quad 5 \quad 6} \\ 2 \overline{) 4 \quad 5 \quad 2} \\ \hline 2 \quad 5 = 60 \text{ in each} \\ 60 \times 4 = 240 \text{ marbles} \end{array}$$

$$\begin{array}{r} 13 \quad 2 \overline{) 8 \quad 10 \quad 12} \\ 2 \overline{) 4 \quad 5 \quad 6} \\ \hline 2 \quad 5 \quad 3 = 120 \text{ yds.} \end{array}$$

$$\begin{array}{r} 14 \quad 2 \overline{) 12 \quad 14 \quad 16} \\ 2 \overline{) 6 \quad 7 \quad 8} \\ \hline 3 \quad 7 \quad 4 = 336 + 4 = \\ \quad 340 \end{array}$$

$$\begin{array}{r} 15 \quad 47 - 2 = 45, = 3, 3, 5 \\ 77 - 2 = 75, = 3, 5, 5 \\ \hline 3, 5 = 15 \end{array}$$

$$\begin{array}{r} 16 \quad 3 \overline{) 3 \quad 12 \quad 30 \quad 75} \\ 5 \overline{) 4 \quad 10 \quad 25} \\ 2 \overline{) 4 \quad 2 \quad 5} \\ \hline 2 \quad 5 = \$300 \\ \text{for each} \\ \$300 \times 4 = \$1200 \text{ for all} \end{array}$$

$$\begin{array}{r} 17 \quad 56 = 2, 2, 2, 7 \\ 63 = 3, 3, 7 \\ 77 = 11, 7 \\ \hline 7 \text{ to each pupil} \\ 56 + 63 + 77 = 196 \\ 196 \div 7 = 28 \text{ pupils} \end{array}$$

$$\begin{array}{r} 18 \quad 7 \overline{) 7 \quad 11 \quad 14 \quad 22} \\ 11 \overline{) 11 \quad 2 \quad 22} \\ 2 \overline{) 2 \quad 2} \\ \hline = 154 \text{ cards} \end{array}$$

$$\begin{array}{r} 19 \quad 18 = 2, 3, 3 \\ 33 = 3, 11 \\ \hline 3 \text{ to each} \\ 18 + 33 = 51, \div 3 = 17 \text{ children} \end{array}$$

## FRACTIONS

98 Page 74

$$1 \quad 45\frac{11}{12} = \frac{540+11}{12} = \frac{551}{12}$$

$$72\frac{9}{10} = \frac{720+9}{10} = \frac{729}{10}$$

$$2 \quad 109\frac{7}{9} = \frac{981+7}{9} = \frac{988}{9}$$

$$25\frac{7}{12} = \frac{300+7}{12} = \frac{307}{12}$$

$$3 \quad 58\frac{2}{19} = \frac{1102+2}{19} = \frac{1104}{19}$$

$$19\frac{1}{38} = \frac{722+1}{38} = \frac{723}{38}$$

$$4 \quad 140\frac{7}{8} = \frac{1120+7}{8} = \frac{1127}{8}$$

$$14\frac{5}{24} = \frac{336+5}{24} = \frac{341}{24}$$

$$5 \quad 13\frac{9}{13} = \frac{169+9}{13} = \frac{178}{13}$$

$$17\frac{5}{8} = \frac{136+5}{8} = \frac{141}{8}$$

$$6 \quad 85\frac{3}{15} = \frac{1275+3}{15} = \frac{1283}{15}$$

$$63\frac{7}{10} = \frac{630+7}{10} = \frac{637}{10}$$

$$7 \quad 49\frac{4}{7} = \frac{343+4}{7} = \frac{347}{7}$$

$$20\frac{13}{14} = \frac{280+13}{14} = \frac{293}{14}$$

$$8 \quad 240\frac{1}{3} = \frac{720+1}{3} = \frac{721}{3}$$

$$10\frac{7}{15} = \frac{150+7}{15} = \frac{157}{15}$$

$$9 \quad 15\frac{3}{16} = \frac{240+3}{16} = \frac{243}{16}$$

$$18\frac{5}{24} = \frac{432+5}{24} = \frac{437}{24}$$

$$10 \quad 104\frac{1}{5} = \frac{520+1}{5} = \frac{521}{5}$$

$$106\frac{5}{6} = \frac{636+5}{6} = \frac{641}{6}$$

$$11 \quad 78\frac{7}{8} = \frac{624+7}{8} = \frac{631}{8}$$

$$49\frac{11}{12} = \frac{588+11}{12} = \frac{599}{12}$$

$$12 \quad 10\frac{9}{50} = \frac{500+9}{50} = \frac{509}{50}$$

$$19\frac{7}{20} = \frac{380+7}{20} = \frac{387}{20}$$

101 Page 75

§84

$$1 \quad \frac{{}^1 135}{{}^1 270} = \frac{{}^{23} 23}{{}^{56} 56} = \frac{{}^1 1}{{}^2 2}$$

$$2 \quad \frac{{}^2 207}{{}^{1017} 1017} = \frac{{}^2 69}{{}^{339} 339} = \frac{{}^{23} 23}{{}^{113} 113}$$

$$3 \quad \frac{{}^2 702}{{}^{4706} 4706} = \frac{{}^{13} 351}{{}^{2353} 2353} = \frac{{}^{27} 27}{{}^{181} 181}$$

$$4 \quad \frac{{}^{1001} 3003}{{}^{11011} 11011} = \frac{{}^3 3}{{}^{11} 11}$$

$$5 \quad \frac{{}^{125} 725}{{}^{4350} 4350} = \frac{{}^1 1}{{}^6 6}$$

$$6 \quad \frac{{}^{29} 87}{{}^{203} 203} = \frac{{}^3 3}{{}^7 7}$$

$$7 \quad \frac{{}^3 129}{{}^{750} 750} = \frac{{}^{43} 43}{{}^{250} 250}$$

$$8 \quad \frac{{}^2 237}{{}^{597} 597} = \frac{{}^{79} 79}{{}^{199} 199}$$

$$9 \quad \frac{{}^5 555}{{}^{975} 975} = \frac{{}^3 111}{{}^{195} 195} = \frac{{}^{37} 37}{{}^{65} 65}$$

$$10 \quad \frac{{}^5 510}{{}^{714} 714} = \frac{{}^2 255}{{}^{357} 357} = \frac{{}^{17} 85}{{}^{119} 119} = \frac{{}^5 5}{{}^7 7}$$

$$11 \quad \frac{{}^2 378}{{}^{1818} 1818} = \frac{{}^2 189}{{}^{909} 909} = \frac{{}^{21} 21}{{}^{101} 101}$$

$$12 \quad \frac{{}^2 1011}{{}^{1101} 1101} = \frac{{}^{337} 337}{{}^{367} 367}$$

$$13 \quad \frac{{}^2 246}{{}^{438} 438} = \frac{{}^{41} 41}{{}^{73} 73}$$

$$14 \quad \frac{{}^2 256}{{}^{20} 20} = \frac{{}^2 32}{{}^{90} 90} = \frac{{}^{16} 16}{{}^{45} 45}$$

$$15 \quad \frac{{}^7 711}{{}^{981} 981} = \frac{{}^{79} 79}{{}^{109} 109}$$

$$16 \quad \frac{{}^{47} 329}{{}^{841} 841} = \frac{{}^7 7}{{}^{18} 18}$$

$$17 \quad \frac{{}^{11} 279}{{}^{496} 496} = \frac{{}^9 9}{{}^{16} 16}$$

$$18 \quad \frac{{}^{12} 213}{{}^{284} 284} = \frac{{}^3 3}{{}^4 4}$$

§86

$$1 \quad (19) \quad \frac{{}^6 24}{{}^{42} 42} = \frac{{}^4 4}{{}^7 7}$$

$$2 \quad (20) \quad \frac{{}^{11} 33}{{}^{187} 187} = \frac{{}^3 3}{{}^{17} 17}$$

$$3 \quad (21) \quad \frac{{}^4 120}{{}^2 216} = \frac{{}^6 30}{{}^4 54} = \frac{5}{9}$$

$$4 \quad (22) \quad \frac{{}^{10} 90}{{}^{18} 180} = \frac{{}^9 9}{{}^{18} 18} = \frac{1}{2}$$

$$5 \quad (23) \quad \frac{{}^9 45}{{}^{10} 108} = \frac{5}{12}$$

$$6 \quad (24) \quad \frac{{}^6 85}{{}^9 95} = \frac{17}{19}$$

$$7 \quad (25) \quad \frac{{}^6 72}{{}^{16} 168} = \frac{{}^4 12}{{}^{28} 28} = \frac{3}{7}$$

$$8 \quad (26) \quad \frac{119}{132} \text{ not reducible.}$$

$$9 \quad (27) \quad \frac{{}^6 24}{{}^{12} 120} = \frac{{}^4 4}{{}^{20} 20} = \frac{1}{5}$$

$$10 \quad (28) \quad \frac{{}^{13} 36}{{}^{14} 144} = \frac{{}^3 3}{{}^{12} 12} = \frac{1}{4}$$

$$11 \quad (29) \quad \frac{{}^6 105}{{}^{13} 135} = \frac{{}^3 21}{{}^{27} 27} = \frac{7}{9}$$

$$12 \quad (30) \quad \frac{{}^{12} 144}{{}^{18} 180} = \frac{{}^3 12}{{}^{15} 15} = \frac{4}{5}$$

$$13 \quad (31) \quad \frac{{}^5 105}{{}^{17} 175} = \frac{{}^7 21}{{}^{35} 35} = \frac{3}{5}$$

$$14 \quad (32) \quad \frac{{}^9 99}{{}^{25} 252} = \frac{11}{28}$$

$$15 \quad (33) \quad \frac{{}^{11} 132}{{}^{16} 165} = \frac{{}^3 12}{{}^{15} 15} = \frac{4}{5}$$

$$16 \quad (34) \quad \frac{{}^{10} 60}{{}^{12} 120} = \frac{{}^6 6}{{}^{12} 12} = \frac{1}{2}$$

$$17 \quad (35) \quad \frac{{}^6 420}{{}^{84} 864} = \frac{{}^2 70}{{}^{144} 144} = \frac{35}{72}$$

$$18 \quad (36) \quad \frac{{}^{15} 75}{{}^{120} 120} = \frac{5}{8}$$

$$19 \quad (37) \quad \frac{{}^4 108}{{}^{25} 252} = \frac{27}{63} = \frac{3}{7}$$

$$20 \quad (38) \quad \frac{{}^{13} 39}{{}^{65} 65} = \frac{3}{5}$$

$$21 \quad (39) \quad \frac{{}^{11} 84}{{}^{132} 132} = \frac{7}{11}$$

$$22 \quad (40) \quad \frac{{}^7 168}{{}^{53} 539} = \frac{24}{77}$$

$$23 \quad (41) \quad \frac{{}^4 112}{{}^{16} 168} = \frac{{}^7 28}{{}^{42} 42} = \frac{{}^2 4}{{}^6 6} = \frac{2}{3}$$

$$24 \quad (42) \quad \frac{{}^{43} 287}{{}^{36} 369} = \frac{7}{9}$$



$$25 \text{ (43)} \quad \frac{{}^{55}55}{110} = \frac{1}{2}$$

$$26 \text{ (44)} \quad \frac{{}^381}{141} = \frac{27}{47}$$

$$27 \text{ (45)} \quad \frac{{}^{13}78}{169} = \frac{6}{13}$$

$$28 \text{ (46)} \quad \frac{{}^{10}150}{330} = \frac{{}^315}{33} = \frac{5}{11}$$

$$29 \text{ (47)} \quad \frac{{}^{11}99}{132} = \frac{{}^39}{12} = \frac{3}{4}$$

$$30 \text{ (48)} \quad \frac{{}^5120}{165} = \frac{{}^324}{33} = \frac{8}{11}$$

$$31 \text{ (49)} \quad \frac{{}^412}{252} = \frac{{}^330}{63} = \frac{10}{21}$$

$$32 \text{ (50)} \quad \frac{{}^{17}85}{102} = \frac{5}{6}$$

$$33 \text{ (51)} \quad \frac{{}^742}{91} = \frac{6}{13}$$

$$34 \text{ (52)} \quad \frac{{}^334}{44} = \frac{17}{22}$$

$$35 \text{ (53)} \quad \frac{{}^728}{98} = \frac{{}^34}{14} = \frac{2}{7}$$

$$36 \text{ (54)} \quad \frac{{}^{10}110}{210} = \frac{11}{21}$$

§95

$$2 \text{ (55)} \quad \frac{{}^7}{119} = \frac{1}{17}$$

$$4 \text{ (56)} \quad \frac{{}^327}{36} = \frac{3}{4}$$

$$5 \text{ (57)} \quad \frac{4}{8} = \frac{1}{2}$$

$$6 \text{ (58)} \quad \frac{{}^5180}{225} = \frac{{}^336}{45} = \frac{4}{5}$$

$$7 \text{ (59)} \quad \frac{{}^4112}{144} = \frac{{}^428}{36} = \frac{7}{9}$$

$$9 \text{ (60)} \quad \frac{{}^{11}41}{164} = \frac{1}{4}$$

$$10 \text{ (61)} \quad \frac{{}^{11}33}{77} = \frac{3}{7}$$

$$10 \text{ (62)} \quad \frac{{}^348}{75} = \frac{16}{25}$$

$$11 \text{ (63)} \quad \frac{{}^525}{80} = \frac{5}{16}$$

$$13 \text{ (64)} \quad \frac{375}{390} = \frac{75}{78} = \frac{25}{26}$$

$$13 \text{ (65)} \quad \frac{1209}{220} = \frac{19}{20}$$

$$15 \text{ (66)} \quad \frac{27}{42} = \frac{9}{14}$$

$$16 \text{ (67)} \quad \frac{17}{51} = \frac{1}{3}$$

$$16 \text{ (68)} \quad \frac{29}{58} = \frac{1}{2}$$

$$18 \text{ (69)} \quad \frac{28}{49} = \frac{4}{7}$$

$$20 \text{ (70)} \quad \frac{18}{32} = \frac{9}{16}$$

## 103 Page 76

Answers to 103 will be found in 107

## 104 Page 77

$$1 \quad \frac{7}{8} \times \frac{5}{5} = \frac{35}{40}; \quad \frac{3}{5} \times \frac{8}{8} = \frac{24}{40}; \quad \frac{15}{4} \times \frac{10}{10} = \frac{150}{40}$$

$$2 \quad \frac{119}{7} = \frac{13}{1} \times \frac{17}{17} = \frac{289}{17}; \quad \frac{7}{119} = \frac{1}{17}; \quad \frac{13}{17} = \frac{13}{17}$$

$$3 \quad \frac{1}{4} \times \frac{18}{18} = \frac{18}{72}; \quad \frac{5}{9} \times \frac{8}{8} = \frac{40}{72}; \quad \frac{17}{8} \times \frac{9}{9} = \frac{153}{72}$$

$$4 \quad \frac{27}{36} = \frac{3}{4} \times \frac{22}{22} = \frac{66}{88}; \quad \frac{45}{22} \times \frac{4}{4} = \frac{180}{88}; \quad \frac{3}{8} \times \frac{11}{11} = \frac{33}{88}$$

$$5 \quad \frac{4}{8} \times \frac{5}{5} = \frac{20}{40}; \quad \frac{27}{8} \times \frac{5}{5} = \frac{135}{40}; \quad \frac{127}{5} \times \frac{8}{8} = \frac{1016}{40}$$

$$6 \quad \frac{125}{120} = \frac{125}{120}; \quad \frac{13}{15} \times \frac{8}{8} = \frac{104}{120}; \quad \frac{180}{225} = \frac{4}{5} \times \frac{24}{24} = \frac{96}{120}$$

$$7 \quad \frac{2}{3} \times \frac{3}{3} = \frac{6}{9}; \frac{125}{3} \times \frac{3}{3} = \frac{375}{9}; \frac{112}{144} = \frac{7}{9}$$

$$8 \quad \frac{54}{83} = \frac{18}{11}; \frac{1}{11} = \frac{1}{11}; \frac{153}{3} = \frac{51}{1}, \times \frac{11}{11} = \frac{561}{11}$$

$$9 \quad \frac{41}{164} = \frac{1}{4} = \frac{25}{100}; \frac{117}{10} = \frac{1170}{100}; \frac{3}{25} = \frac{12}{100}$$

$$10 \quad \frac{11}{50} = \frac{77}{350}; \frac{33}{77} = \frac{3}{7} = \frac{150}{350}; \frac{48}{75} = \frac{16}{25} = \frac{224}{350}$$

$$11 \quad \frac{25}{80} = \frac{5}{16} = \frac{15}{48}; \frac{3}{9} = \frac{1}{3} = \frac{16}{48}; \frac{5}{16} = \frac{15}{48}$$

$$12 \quad \frac{5}{12} = \frac{35}{84}; \frac{187}{7} = \frac{2244}{84}; \frac{209}{11} = \frac{19}{1} = \frac{1596}{84}$$

$$13 \quad \frac{401}{130} = \frac{802}{260}; \frac{375}{390} = \frac{125}{130} = \frac{250}{260}; \frac{209}{220} = \frac{19}{20} = \frac{247}{260}$$

$$14 \quad \frac{7}{9} = \frac{56}{72}; \frac{111}{3} = \frac{2664}{72}; \frac{5}{8} = \frac{45}{72}$$

$$15 \quad \frac{7}{8} = \frac{49}{56}; \frac{9}{14} = \frac{36}{56}; \frac{27}{42} = \frac{9}{14} = \frac{36}{56}$$

$$16 \quad \frac{11}{14} = \frac{33}{42}; \frac{17}{51} = \frac{1}{3} = \frac{14}{42}; \frac{29}{58} = \frac{1}{2} = \frac{21}{42}$$

$$17 \quad \frac{260}{11} = \frac{7540}{319}; \frac{501}{29} = \frac{5511}{319}; \frac{7}{11} = \frac{203}{319}$$

$$18 \quad \frac{5}{7} = \frac{80}{112}; \frac{28}{49} = \frac{4}{7} = \frac{64}{112}; \frac{7}{16} = \frac{49}{112}$$

$$19 \quad \frac{130}{7} = \frac{1040}{56}; \frac{58}{16} = \frac{29}{8} = \frac{203}{56}; \frac{1}{56} = \frac{1}{56}$$

$$20 \quad \frac{133}{19} = \frac{7}{1} = \frac{112}{16}; \frac{18}{32} = \frac{9}{16}; \frac{9}{12} = \frac{3}{4} = \frac{12}{16}$$

$$21 \quad \frac{1}{2} = \frac{10}{20}; \frac{3}{4} = \frac{15}{20}; \frac{171}{10} = \frac{342}{20}$$

107 Page 78

$$1 \quad \frac{8}{12} = \frac{2}{3} = \frac{20}{30}; \frac{7}{14} = \frac{1}{2} = \frac{15}{30}; \frac{6}{10} = \frac{3}{5} = \frac{18}{30}$$

$$\frac{20+15+18}{30} = \frac{53}{30} = 1\frac{23}{30}$$

$$2 \quad \frac{9}{15} = \frac{3}{5} = \frac{36}{60}; \frac{14}{21} = \frac{2}{3} = \frac{40}{60}; \frac{18}{24} = \frac{3}{4} = \frac{45}{60}$$

$$\frac{36+40+45}{60} = \frac{121}{60} = 2\frac{1}{6}$$

$$3 \quad \frac{18}{27} = \frac{2}{3} = \frac{16}{24}; \frac{20}{32} = \frac{5}{8} = \frac{15}{24}; \frac{18}{36} = \frac{1}{2} = \frac{12}{24}$$

$$\frac{16+15+12}{24} = \frac{43}{24} = 1\frac{19}{24}$$

$$4 \quad \frac{5}{15} = \frac{1}{3} = \frac{8}{24}; \quad \frac{8}{48} = \frac{1}{6} = \frac{4}{24}; \quad \frac{6}{48} = \frac{1}{8} = \frac{3}{24}$$

$$\frac{8+4+3}{24} = \frac{15}{24} = \frac{5}{8}$$

$$5 \quad \frac{6}{9} = \frac{2}{3} = \frac{8}{12}; \quad \frac{4}{48} = \frac{1}{12}; \quad \frac{12}{48} = \frac{3}{12} \quad \frac{8+1+3}{12} = \frac{12}{12} = 1$$

$$6 \quad \frac{18}{30} = \frac{3}{5}; \quad \frac{15}{30} = \frac{1}{2}; \quad \frac{20}{30} = \frac{2}{3} \quad \frac{18+15+20}{30} = \frac{53}{30} = 1\frac{23}{30}$$

$$7 \quad \frac{30}{36} = \frac{5}{6} = \frac{25}{30}; \quad \frac{24}{30} = \frac{4}{5}; \quad \frac{24}{36} = \frac{2}{3} = \frac{20}{30}$$

$$\frac{25+24+20}{30} = \frac{69}{30} = 2\frac{3}{10}$$

$$8 \quad \frac{15}{35} = \frac{3}{7} = \frac{12}{28}; \quad \frac{42}{49} = \frac{6}{7} = \frac{24}{28}; \quad \frac{21}{28} = \frac{3}{4}$$

$$\frac{12+24+21}{28} = \frac{57}{28} = 2\frac{1}{4}$$

$$9 \quad \frac{12}{36} = \frac{1}{3} = \frac{8}{24}; \quad \frac{16}{32} = \frac{1}{2} = \frac{12}{24}; \quad \frac{28}{32} = \frac{7}{8} = \frac{21}{24}$$

$$\frac{8+12+21}{24} = \frac{41}{24} = 1\frac{17}{24}$$

$$10 \quad \frac{16}{24} = \frac{2}{3} = \frac{20}{30}; \quad \frac{16}{20} = \frac{4}{5} = \frac{24}{30}; \quad \frac{18}{20} = \frac{9}{10} = \frac{27}{30}$$

$$\frac{20+24+27}{30} = \frac{71}{30} = 2\frac{11}{30}$$

$$11 \quad \frac{8}{18} = \frac{4}{9} = \frac{48}{108}; \quad \frac{20}{60} = \frac{1}{3} = \frac{36}{108}; \quad \frac{5}{60} = \frac{1}{12} = \frac{9}{108}$$

$$\frac{48+36+9}{108} = \frac{93}{108} = \frac{31}{36}$$

$$12 \quad \frac{10}{35} = \frac{2}{7}; \quad \frac{7}{35} = \frac{1}{5}; \quad \frac{14}{35} = \frac{14}{35} \quad \frac{10+7+14}{35} = \frac{31}{35}$$

$$13 \quad \frac{36}{42} = \frac{6}{7} = \frac{30}{35}; \quad \frac{36}{45} = \frac{4}{5} = \frac{28}{35}; \quad \frac{33}{55} = \frac{3}{5} = \frac{21}{35}$$

$$\frac{30+28+21}{35} = \frac{79}{35} = 2\frac{9}{35}$$

$$14 \quad \frac{33}{44} = \frac{3}{4} = \frac{9}{12}; \quad \frac{36}{54} = \frac{2}{3} = \frac{8}{12}; \quad \frac{5}{10} = \frac{1}{2} = \frac{6}{12}$$

$$\frac{9+8+6}{12} = \frac{23}{12} = 1\frac{11}{12}$$

$$15 \quad \frac{16}{48} = \frac{1}{3} = \frac{2}{6}; \quad \frac{30}{60} = \frac{1}{2} = \frac{3}{6}; \quad \frac{45}{54} = \frac{5}{6}$$

$$\frac{2+3+5}{6} = \frac{10}{6} = 1\frac{2}{3}$$

$$16 \quad \frac{15}{45} = \frac{1}{3} = \frac{20}{60}; \quad \frac{12}{60} = \frac{1}{5} = \frac{12}{60}; \quad \frac{10}{40} = \frac{1}{4} = \frac{15}{60};$$

$$\frac{20+12+15}{60} = \frac{47}{60}$$

$$17 (1) \quad \frac{20+15}{30} = \frac{35}{30}, \quad \frac{18}{30} = \frac{17}{30}$$

$$18 (2) \frac{36+40}{60} = \frac{76}{60}, - \frac{45}{60} = \frac{31}{60}$$

$$19 (3) \frac{16+15}{24} = \frac{31}{24}, - \frac{12}{24} = \frac{19}{24}$$

$$20 (4) \frac{2+1}{6} = \frac{3}{6} = \frac{1}{2} = \frac{4}{8}, - \frac{1}{8} = \frac{3}{8}$$

$$21 (5) \frac{8+1}{12} = \frac{9}{12} = \frac{3}{4}, - \frac{1}{4} = \frac{1}{2}$$

$$22 (6) \frac{18+15}{30} = \frac{33}{30}, - \frac{20}{30} = \frac{13}{30}$$

$$23 (7) \frac{25+24}{30} = \frac{49}{30}, - \frac{20}{30} = \frac{29}{30}$$

$$24 (8) \frac{3+6}{7} + \frac{9}{7} = \frac{36}{28}, - \frac{21}{28} = \frac{15}{28}$$

$$25 (9) \frac{8+12}{24} = \frac{20}{24}; \frac{21}{24} = \frac{20}{24} = \frac{1}{24}$$

$$26 (10) \frac{20+24}{30} = \frac{44}{30}, - \frac{27}{30} = \frac{17}{30}$$

$$27 (11) \frac{4+3}{9} = \frac{7}{9} = \frac{28}{36}, - \frac{3}{36} = \frac{25}{36}$$

$$28 (12) \frac{10+7}{35} = \frac{17}{35}, - \frac{14}{35} = \frac{3}{35}$$

$$29 \quad (13) \quad \frac{30+28}{35} = \frac{58}{35}, - \frac{21}{35} = 1\frac{2}{35}$$

$$30 \quad (14) \quad \frac{9+8}{12} = \frac{17}{12}, - \frac{6}{12} = \frac{11}{12}$$

$$31 \quad (15) \quad \frac{2+3}{6} = \frac{5}{6}, - \frac{5}{6} = 0$$

$$32 \quad (16) \quad \frac{20+12}{60} = \frac{32}{60}, - \frac{15}{60} = \frac{17}{60}$$

109 Page 78

$$1 \quad \frac{4}{10} + \frac{4}{10} + \frac{3}{10} = 7\frac{4}{10} = 9\frac{2}{10}$$

$$2 \quad 17 + \frac{1}{17} + 5\frac{1}{17} = 22\frac{1}{17}$$

$$3 \quad 72\frac{1}{2} + 18\frac{1}{2} + 2\frac{2}{2} = 92\frac{1}{2}$$

$$4 \quad \frac{4}{8} + 2\frac{4}{8} + \frac{4}{8} = 2\frac{10}{8} = 3\frac{1}{2}$$

$$5 \quad \frac{4}{10} + 3\frac{4}{10} + 25\frac{4}{10} = 28\frac{4}{10} = 29\frac{1}{5}$$

$$6 \quad 1\frac{5}{10} + 13\frac{7}{10} + \frac{9}{10} = 14\frac{21}{10} = 15\frac{1}{2}$$

$$7 \quad 144\frac{4}{5} + 41\frac{4}{5} + \frac{4}{5} = 185\frac{8}{5} = 187\frac{3}{5}$$

$$8 \quad 1\frac{7}{11} + 25\frac{7}{11} + 51 = 77\frac{7}{11}$$

$$9 \quad \frac{15}{100} + 11\frac{70}{100} + 49\frac{10}{100} = 60\frac{95}{100} = 61\frac{19}{20}$$

$$10 \quad 19\frac{7}{10} + \frac{11}{10} + \frac{11}{10} = 19\frac{19}{10} = 20\frac{9}{10}$$

$$11 \quad \frac{4}{8} + 15\frac{4}{8} + 12\frac{4}{8} = 27\frac{4}{8} = 27\frac{1}{2}$$



$$12 \quad 23\frac{1}{2} + 26\frac{1}{2} + 19 = 68\frac{1}{2} = 69\frac{1}{2}$$

$$13 \quad 3\frac{2}{3} + \frac{1}{3} + \frac{1}{3} = 3\frac{1}{3} = 4\frac{1}{3}$$

$$14 \quad 23\frac{1}{2} + 37 + 17\frac{1}{2} = 77\frac{1}{2} = 78\frac{1}{2}$$

$$15 \quad 29\frac{1}{8} + 4\frac{1}{8} + \frac{1}{8} = 33\frac{1}{8} = 35\frac{3}{8}$$

$$16 \quad \frac{1}{2} + \frac{1}{2} + \frac{1}{2} = \frac{3}{2} = 1\frac{1}{2}$$

$$17 \quad 23\frac{1}{3} + 17\frac{1}{3} + \frac{1}{3} = 40\frac{1}{3} = 41\frac{1}{3}$$

$$18 \quad 11\frac{1}{12} + \frac{1}{12} + 21\frac{1}{12} = 32\frac{1}{12} = 33\frac{1}{12}$$

$$19 \quad 18\frac{1}{8} + 3\frac{1}{8} + 7\frac{1}{8} = 28\frac{1}{8} = 29\frac{1}{8}$$

$$20 \quad 7 + \frac{1}{8} + 13\frac{1}{8} = 20\frac{1}{8} = 21\frac{1}{8}$$

$$21 \quad 41\frac{1}{10} + 47\frac{1}{10} + 17\frac{1}{10} = 105\frac{1}{10} = 106\frac{1}{10}$$

111 Page 78

$$1 \quad 45\frac{1}{8} - \frac{1}{8} = 45\frac{7}{8}; 72\frac{1}{8} - \frac{1}{8} = 72\frac{7}{8}$$

$$2 \quad 109\frac{1}{8} - \frac{1}{8} = 109\frac{7}{8}; 25\frac{1}{8} - \frac{1}{8} = 24\frac{7}{8}$$

$$3 \quad 58\frac{7}{8} - \frac{1}{8} = 57\frac{6}{8}; 19\frac{1}{8} - \frac{1}{8} = 18\frac{7}{8}$$

$$4 \quad 140\frac{1}{2} - \frac{1}{2} = 140\frac{1}{4}; 14\frac{1}{2} - \frac{1}{2} = 13\frac{1}{2}$$

$$5 \quad 13\frac{1}{4} - \frac{1}{4} = 12\frac{3}{4}; 17\frac{1}{2} - \frac{1}{2} = 16\frac{1}{2}$$

$$6 \quad 85\frac{1}{8} - \frac{1}{8} = 84\frac{7}{8}; 63\frac{1}{8} - \frac{1}{8} = 62\frac{1}{4}$$

$$7 \quad 49\frac{7}{8} - \frac{1}{8} = 48\frac{6}{8}; 20\frac{1}{8} - \frac{1}{8} = 20\frac{1}{8}$$

$$8 \quad 240\frac{1}{8} - \frac{1}{8} = 239\frac{7}{8}; 10\frac{1}{8} - \frac{1}{8} = 9\frac{7}{8}$$

- 9  $15\frac{27}{44} - \frac{194}{44} = 14\frac{87}{44}$ ;  $18\frac{1}{2} - \frac{7}{2} = 17\frac{1}{2} = 30$
- 10  $104\frac{1}{8} - \frac{1}{8} = 103\frac{1}{8}$ ;  $106\frac{1}{8} - \frac{1}{8} = 106\frac{1}{8}$
- 11  $78\frac{1}{2} - \frac{5}{2} = 78\frac{1}{2}$ ;  $49\frac{1}{2} - \frac{3}{2} = 49\frac{1}{2}$
- 12  $10\frac{11}{10} - \frac{1}{10} = 9\frac{10}{10} = 9\frac{10}{10}$ ;  $19\frac{1}{10} - \frac{1}{10} = 18\frac{1}{10}$

## 114 Page 80

- 1  $41\frac{1}{2} + 3\frac{1}{2} + \frac{1}{2} = \$45\frac{1}{2}$
- 2  $155\frac{1}{8} + 76\frac{1}{8} + 111\frac{1}{8} = 342\frac{3}{8} = 344\frac{1}{8}$
- 3  $723\frac{1}{10} - 149\frac{1}{10} = 573\frac{1}{10} = 573\frac{9}{10}$
- 4  $125 - 13\frac{1}{2} = \$111\frac{1}{2}$  cost.
- 5  $\frac{1}{8} + \frac{3}{8} = \frac{4}{8}$ ;  $\frac{3}{8} - \frac{1}{8} = \frac{2}{8}$
- 6  $\frac{1}{10} - \frac{4}{10} = \frac{9}{10}$
- 7  $31\frac{2}{3} + 46\frac{1}{3} + 59\frac{1}{3} = 137\frac{1}{3}$  rd.
- 8  $17\frac{1}{2} + 23\frac{1}{2} + 41\frac{1}{2} = 82\frac{1}{2}$       $237\frac{1}{2} - 82\frac{1}{2} = 154\frac{1}{2}$  lb.
- 9  $8\frac{1}{8} + 9\frac{1}{8} + 11\frac{1}{8} + 80\frac{1}{8} + 13\frac{1}{8} + 13\frac{1}{8} = 65\frac{1}{8}$  hr.
- 10  $27\frac{1}{8} + 34\frac{1}{8} + 31\frac{1}{8} = 93\frac{1}{8}$       $179\frac{1}{8} - 93\frac{1}{8} = 85\frac{1}{8}$  mi.
- 11  $17\frac{1}{2} + 18\frac{1}{2} + 14\frac{1}{2} = 50\frac{1}{2}$       $108\frac{1}{2} - 50\frac{1}{2} = 57\frac{1}{2}$  yd.
- 12  $101\frac{7}{8} - 53\frac{1}{8} = 48\frac{1}{2}$  ft.
- 13  $\frac{1}{2} - \frac{1}{2} = \frac{1}{2}$
- 14  $37\frac{24}{128} + 41\frac{1}{128} + 29\frac{1}{128} + 54\frac{7}{128} = 162\frac{33}{128}$  cd.

$$15 \quad 171\frac{7}{10} + 235\frac{7}{10} = 406\frac{14}{10} \text{ mi.}$$

$$16 \quad 235\frac{7}{10} - 171\frac{7}{10} = 63\frac{14}{10} \text{ mi.}$$

$$17 \quad 119\frac{12}{10} + 91\frac{7}{10} + 75\frac{10}{10} = 286\frac{29}{10} \text{ A}$$

$$18 \quad \frac{88}{170} + \frac{84}{170} + \frac{80}{170} = \frac{252}{170}. \quad \frac{170}{170} - \frac{148}{170} = \frac{122}{170}$$

$$19 \quad 17\frac{1}{2} + 17\frac{1}{2} + 14\frac{1}{2} + 14\frac{1}{2} = 63\frac{1}{2} \text{ ft.}$$

$$20 \quad 117\frac{7}{10} + 7\frac{2}{10} = \$124\frac{9}{10}$$

$$21 \quad 53\frac{1}{2} + 41\frac{9}{10} = 95\frac{7}{10} \text{ hr.}$$

## 116 Page 82

$$1 \quad 45\frac{1}{2} \times 11 = 495\frac{11}{2} = 505\frac{1}{2}$$

$$72\frac{2}{10} \times 11 = 792\frac{22}{10} = 801\frac{11}{50}$$

$$2 \quad 109\frac{7}{10} \times 11 = 1199\frac{77}{10} = 1207\frac{7}{10}$$

$$25\frac{7}{12} \times 11 = 275\frac{77}{12} = 281\frac{5}{12}$$

$$3 \quad 58\frac{2}{10} \times 11 = 638\frac{22}{10} = 639\frac{11}{50}$$

$$19\frac{1}{8} \times 11 = 209\frac{11}{8}$$

$$4 \quad 140\frac{7}{8} \times 11 = 1540\frac{77}{8} = 1549\frac{5}{8}$$

$$14\frac{5}{12} \times 11 = 154\frac{55}{12} = 156\frac{11}{12}$$

$$5 \quad 13\frac{9}{13} \times 13 = 169 + 9 = 178$$

$$17\frac{5}{8} \times 13 = 221\frac{65}{8} = 229\frac{1}{8}$$

$$6 \quad 85\frac{4}{15} \times 13 = 1105\frac{52}{15} = 1111\frac{4}{15}$$

$$63\frac{7}{10} \times 13 = 819\frac{49}{10} = 828\frac{9}{10}$$

$$7 \quad 49\frac{1}{3} \times 12 = 637\frac{2}{3} = 644\frac{2}{3}$$

$$20\frac{1}{3} \times 13 = 260\frac{13}{3} = 272\frac{1}{3}$$

$$8 \quad 240\frac{1}{3} \times 13 = 3120\frac{13}{3} = 3124\frac{1}{3}$$

$$10\frac{7}{15} \times 14 = 130\frac{7}{3} = 136\frac{1}{3}$$

$$9 \quad 15\frac{1}{6} \times 17 = 255\frac{1}{6} = 258\frac{1}{2}$$

$$18\frac{3}{4} \times 17 = 306\frac{3}{4} = 309\frac{3}{4}$$

$$10 \quad 104\frac{1}{3} \times 17 = 1768\frac{1}{3} = 1771\frac{2}{3}$$

$$106\frac{2}{3} \times 17 = 1802\frac{2}{3} = 1816\frac{2}{3}$$

$$11 \quad 78\frac{1}{3} \times 17 = 1326\frac{1}{3} = 1340\frac{2}{3}$$

$$49\frac{1}{3} \times 17 = 1133\frac{1}{3} = 848\frac{2}{3}$$

$$12 \quad 10\frac{9}{10} \times 17 = 170\frac{9}{10} = 173\frac{3}{10}$$

$$19\frac{7}{10} \times 17 = 323\frac{7}{10} = 328\frac{7}{10}$$

## 119 Page 83

$$1 \quad 25 \times \$7\frac{3}{4} = \$193\frac{3}{4}$$

$$2 \quad 19 \times \$2\frac{3}{4} = \$49\frac{3}{4}$$

$$3 \quad 160 \times \$65\frac{1}{2} = \$10480$$

$$4 \quad 12 \times 31\frac{1}{2} = 378 \text{ gal.}$$

$$5 \quad 175 \times \$1\frac{1}{10} = \$192\frac{1}{2}$$

$$6 \quad 11 \times 3\frac{1}{2} = 39\frac{1}{2} \text{ mi.}$$

$$7 \quad 12 \times 18\frac{7}{8} = 221\frac{1}{2} \text{ hrs.}$$

$$8 \quad 6 \times 12\frac{1}{3} = 74\frac{2}{3} \text{ pp.}$$

$$9 \quad 12 \times \$728\frac{1}{2} = \$8746$$

$$10 \quad 80 \times 5\frac{1}{2} = 440 \text{ yds.}$$

## 122 Page 84

(The cancellation, being simple, is not indicated)

$$1 \quad \frac{2}{3} \text{ of } 15 = 10$$

$$2 \quad \frac{2}{3} \text{ of } 29 = \frac{58}{3} = 19\frac{1}{3}$$

$$3 \quad \frac{2}{3} \text{ of } 31 = \frac{62}{3} = 20\frac{2}{3}$$

$$4 \quad \frac{2}{3} \text{ of } 23 = \frac{46}{3} = 15\frac{1}{3}$$

$$5 \quad \frac{2}{3} \text{ of } 18 = 12$$

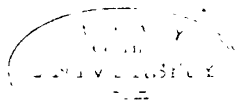
$$6 \quad \frac{2}{3} \text{ of } 9 = 6$$

$$7 \quad \frac{2}{3} \text{ of } 0 = 0$$

$$8 \quad \frac{2}{3} \text{ of } 24 = 16$$

$$9 \quad \frac{2}{3} \text{ of } 17 = \frac{34}{3} = 11\frac{1}{3}$$

$$10 \quad \frac{2}{3} \text{ of } 27 = 18$$



11  $\frac{2}{3}$  of 14 =  $9\frac{1}{3}$

12  $\frac{2}{3}$  of 11 =  $7\frac{1}{3}$

13  $\frac{2}{3}$  of 44 =  $29\frac{1}{3}$

14  $\frac{2}{3}$  of 37 =  $24\frac{2}{3}$

15  $\frac{2}{3}$  of 28 = 18

16  $\frac{2}{3}$  of 19 =  $12\frac{2}{3}$

17  $\frac{2}{3}$  of 7 = 4

18  $\frac{2}{3}$  of 14 = 9

19  $\frac{2}{3}$  of 24 = 16

20  $\frac{2}{3}$  of 32 = 21

21  $\frac{2}{3}$  of 46 = 30

22  $\frac{2}{3}$  of 56 = 37

23  $\frac{2}{3}$  of 38 = 25

24  $\frac{2}{3}$  of 43 = 28

25  $\frac{2}{3}$  of 22 = 14

26  $\frac{2}{3}$  of 35 = 23

27  $\frac{2}{3}$  of 41 = 27

28  $\frac{2}{3}$  of 80 = 53

29  $\frac{2}{3}$  of 72 = 48

30  $\frac{2}{3}$  of 56 = 37

31  $\frac{2}{3}$  of 19 = 12

32  $\frac{2}{3}$  of 7 = 4

33  $\frac{2}{3}$  of 26 = 17

34  $\frac{2}{3}$  of 81 = 54

35  $\frac{2}{3}$  of 93 = 62

36  $\frac{2}{3}$  of 45 = 30

37  $\frac{2}{3}$  of 36 = 24

38  $\frac{2}{3}$  of 43 = 28

39  $\frac{2}{3}$  of 14 = 9

40  $\frac{2}{3}$  of 8 = 5

41  $\frac{2}{3}$  of 49 = 32

42  $\frac{2}{3}$  of 53 = 35

43  $\frac{2}{3}$  of 62 = 41

44  $\frac{2}{3}$  of 25 = 16

45  $\frac{2}{3}$  of 33 = 22

46  $\frac{2}{3}$  of 18 = 12

47  $\frac{2}{3}$  of 42 = 28

48  $\frac{2}{3}$  of 51 = 34

## 125 Page 86

(The cancellation, being simple, is not indicated)

$$1 \quad \frac{55}{56} \times \frac{7}{11} = \frac{5}{8}$$

$$2 \quad \frac{13}{25} \times \frac{5}{39} = \frac{1}{15}$$

$$3 \quad \frac{14}{15} \times \frac{25}{28} = \frac{5}{6}$$

$$4 \quad \frac{11}{16} \times \frac{7}{8} = \frac{77}{128}$$

$$5 \quad \frac{57}{108} \times \frac{12}{19} = \frac{1}{3}$$

$$6 \quad \frac{75}{105} \times \frac{84}{120} = \frac{1}{2}$$

$$7 \quad \frac{85}{108} \times \frac{81}{95} = \frac{51}{76}$$

$$8 \quad \frac{84}{119} \times \frac{17}{24} = \frac{1}{2}$$

$$9 \quad \frac{55}{81} \times \frac{141}{143} = \frac{235}{351}$$

$$10 \quad \frac{39}{60} \times \frac{40}{65} = \frac{2}{5}$$

$$11 \quad \frac{21}{26} \times \frac{13}{14} = \frac{3}{4}$$

$$12 \quad \frac{19}{20} \times \frac{13}{20} = \frac{247}{400}$$

$$13 \quad \frac{32}{75} \times \frac{25}{48} = \frac{2}{9}$$

$$14 \quad \frac{325}{7} \times \frac{1}{25} = \frac{13}{7} = 1\frac{6}{7}$$

$$15 \quad \frac{3}{160} \times \frac{32}{9} = \frac{1}{15}$$

$$16 \quad \frac{7}{64} \times \frac{24}{35} = \frac{3}{40}$$

$$17 \quad \frac{150}{151} \times \frac{3}{5} = \frac{90}{151}$$

$$18 \quad \frac{19}{38} \times \frac{7}{14} = \frac{1}{4}$$

## 126 Page 87

(The cancellation, being simple, is not indicated)

$$1 \quad \frac{21}{5} \times \frac{15}{2} = \frac{63}{2} = 31\frac{1}{2}$$

$$2 \quad \frac{11}{3} \times \frac{29}{5} = \frac{319}{15} = 21\frac{4}{5}$$

$$3 \quad \frac{73}{8} \times \frac{75}{8} = \frac{5475}{64} = 85\frac{35}{64}$$

$$4 \quad \frac{47}{6} \times \frac{60}{7} = \frac{470}{7} = 67\frac{1}{7}$$

$$5 \quad \frac{29}{8} \times \frac{7}{4} = \frac{203}{32} = 6\frac{11}{32}$$

$$6 \quad \frac{50}{9} \times \frac{35}{3} = \frac{1750}{27} = 64\frac{22}{27}$$

$$7 \quad \frac{43}{5} \times \frac{59}{8} = \frac{354}{5} = 70\frac{4}{5}$$

$$8 \quad \frac{53}{10} \times \frac{100}{11} = \frac{530}{11} = 48\frac{2}{11}$$

$$9 \quad \frac{42}{5} \times \frac{77}{10} = \frac{1617}{25} = 64\frac{17}{25}$$

$$10 \quad \frac{38}{3} \times \frac{47}{6} = \frac{893}{9} = 99\frac{2}{9}$$

$$11 \quad \frac{9}{2} \times \frac{23}{4} = \frac{207}{8} = 25\frac{7}{8}$$

$$12 \quad \frac{48}{7} \times \frac{23}{3} = \frac{368}{7} = 52\frac{4}{7}$$

$$13 \quad \frac{113}{12} \times \frac{71}{8} = \frac{8023}{96} = 83\frac{55}{96}$$

$$14 \quad \frac{87}{11} \times \frac{55}{7} = \frac{435}{7} = 62\frac{1}{7}$$

$$15 \quad \frac{75}{6} \times \frac{101}{10} = \frac{505}{4} = 126\frac{1}{4}$$

$$16 \quad \frac{47}{3} \times \frac{53}{9} = \frac{2491}{27} = 92\frac{7}{27}$$

$$17 \quad \frac{551}{12} \times \frac{729}{10} = \frac{133893}{40} = 3347\frac{13}{40}$$

$$18 \quad \frac{988}{9} \times \frac{307}{12} = \frac{75829}{27} = 2808\frac{1}{27}$$

$$19 \quad \frac{1104}{19} \times \frac{723}{38} = \frac{399096}{361} = 1105\frac{11}{361}$$

$$20 \quad \frac{1127}{8} \times \frac{341}{24} = \frac{384307}{192} = 2001\frac{11}{192}$$

$$21 \quad \frac{178}{13} \times \frac{141}{8} = \frac{12549}{52} = 241\frac{17}{52}$$

$$22 \quad \frac{1283}{15} \times \frac{637}{10} = \frac{817271}{150} = 5448\frac{71}{150}$$

$$23 \quad \frac{347}{7} \times \frac{293}{14} = \frac{101671}{98} = 1037\frac{5}{98}$$

$$24 \quad \frac{721}{3} \times \frac{157}{15} = \frac{13197}{45} = 251\frac{21}{45}$$

$$25 \quad \frac{243}{16} \times \frac{437}{24} = \frac{35397}{128} = 276\frac{99}{128}$$

$$26 \quad \frac{521}{5} \times \frac{641}{6} = \frac{333961}{30} = 11132\frac{1}{30}$$

$$27 \quad \frac{631}{8} \times \frac{599}{12} = \frac{377969}{96} = 3937\frac{17}{96}$$

$$28 \quad \frac{509}{50} \times \frac{387}{20} = \frac{196983}{1000} = 196\frac{983}{1000}$$

128 Page 87

$$1 \quad \frac{75}{4} \times \frac{47}{20} = \frac{705}{16} = 44\frac{1}{16}$$

$$2 \quad \frac{65}{3} \times \frac{98}{5} = \frac{1274}{3} = 424\frac{2}{3} \text{ mi.}$$

$$3 \quad \frac{725}{16} \times \frac{68}{5} = \frac{2465}{4} = 616\frac{1}{4}$$

$$4 \quad \frac{39}{4} \times \frac{1}{4} = \frac{39}{16} = 2\frac{7}{16}$$

$$5 \quad \frac{43}{2} \times \frac{25}{2} = \frac{1075}{4} = 268\frac{3}{4} \text{ cts.}$$

$$6 \quad \frac{1581}{8} \times \frac{35}{3} = \frac{8445}{8} = 2305\frac{5}{8} \text{ lb.}$$

$$7 \quad \frac{19}{4} \times \frac{17}{2} = \frac{323}{8} = 40\frac{3}{8}$$

$$8 \quad \frac{239}{8} \times \frac{9}{4} = \frac{2151}{32} = 67\frac{7}{32}$$

$$9 \quad \frac{119}{16} \times \frac{141}{7} = \frac{2397}{16} = 149\frac{13}{16} \text{ mi.}$$

$$10 \quad \frac{139}{5} \times \frac{19}{2} = \frac{2641}{10} = 264\frac{1}{10} \text{ mi.}$$



## 134 Page 90

$$1 \quad \frac{21}{5} \div \frac{15}{2} = \frac{21}{5} \times \frac{2}{15} = \frac{14}{25}$$

$$2 \quad \frac{11}{3} \div \frac{29}{5} = \frac{11}{3} \times \frac{5}{29} = \frac{55}{87}$$

$$3 \quad \frac{73}{8} \div \frac{75}{8} = \frac{73}{8} \times \frac{8}{75} = \frac{73}{75}$$

$$4 \quad \frac{47}{6} \div \frac{60}{7} = \frac{47}{6} \times \frac{7}{60} = \frac{329}{360}$$

$$5 \quad \frac{29}{8} \div \frac{7}{4} = \frac{29}{8} \times \frac{4}{7} = 2\frac{1}{4}$$

$$6 \quad \frac{50}{9} \div \frac{35}{3} = \frac{50}{9} \times \frac{3}{35} = \frac{10}{21}$$

$$7 \quad \frac{48}{5} \div \frac{59}{8} = \frac{48}{5} \times \frac{8}{59} = 1\frac{384}{295}$$

$$8 \quad \frac{53}{10} \div \frac{100}{11} = \frac{53}{10} \times \frac{11}{100} = \frac{583}{1000}$$

$$9 \quad \frac{42}{5} \div \frac{77}{10} = \frac{42}{5} \times \frac{10}{77} = 1\frac{1}{11}$$

$$10 \quad \frac{38}{3} \div \frac{47}{6} = \frac{38}{3} \times \frac{6}{47} = 1\frac{152}{47}$$

$$11 \quad \frac{9}{2} \div \frac{23}{4} = \frac{9}{2} \times \frac{4}{23} = \frac{18}{23}$$

$$12 \quad \frac{48}{7} \div \frac{23}{3} = \frac{48}{7} \times \frac{3}{23} = \frac{144}{161}$$

$$13 \quad \frac{113}{12} \div \frac{71}{8} = \frac{113}{12} \times \frac{8}{71} = 1\frac{113}{9}$$

$$14 \quad \frac{87}{11} \div \frac{55}{7} = \frac{87}{11} \times \frac{7}{55} = 1\frac{609}{605}$$

$$15 \quad \frac{75}{6} \div \frac{101}{10} = \frac{75}{6} \times \frac{10}{101} = 1\frac{25}{101}$$

$$16 \quad \frac{47}{3} \div \frac{53}{9} = \frac{47}{3} \times \frac{9}{53} = 2\frac{13}{53}$$

## 135 Page 90

$$1 \quad \frac{286}{10} \div \frac{13}{5} = \frac{286}{10} \times \frac{5}{13} = 11$$

$$2 \quad \frac{491}{2} \div \frac{7}{2} = \frac{491}{2} \times \frac{2}{7} = 70\frac{1}{7} \text{ da.}$$

$$3 \quad 30 \div \frac{41}{12} = \frac{30}{1} \times \frac{12}{41} = 8\frac{12}{41}$$

$$4 \quad \frac{507}{4} \div \frac{39}{4} = \frac{507}{4} \times \frac{4}{39} = 13$$

$$5 \quad \frac{169}{6} \div \frac{13}{6} = \frac{169}{6} \times \frac{6}{13} = 13 \text{ dresses}$$

$$6 \quad \frac{1833}{4} \div \frac{1833}{16} = \frac{1833}{4} \times \frac{16}{1833} = 4 \text{ sons}$$

$$7 \quad 3 \div \frac{1}{9} = 3 \times 9 = 27 \text{ divisions}$$

$$8 \quad \frac{33}{2} \div \frac{11}{6} = \frac{33}{2} \times \frac{6}{11} = 9 \text{ steps}$$

$$9 \quad \frac{116}{3} \div \frac{29}{4} = \frac{116}{3} \times \frac{4}{29} = \frac{16}{3} = 5\frac{1}{3} \text{ da}$$

$$10 \quad 16 = \frac{5}{4} = 16 \times \frac{4}{5} = \frac{64}{5} = 12\frac{4}{5} \text{ cu. ft.}$$

136 Page 91

$$1 \quad \frac{1}{3} \times \frac{7}{9} \times \frac{9}{5} = \frac{7}{15}$$

$$2 \quad \frac{3}{2} \times \frac{3}{2} \times \frac{4}{3} = 3$$

$$3 \quad \frac{7}{1} \times \frac{3}{1} \times \frac{5}{9} \times \frac{4}{9} \times \frac{9}{8} \times \frac{35}{6} = 5\frac{1}{2}$$

$$4 \quad \frac{11}{1} \times \frac{2}{3} \times \frac{7}{22} \times \frac{7}{3} = 2\frac{1}{3}$$

$$5 \quad \frac{1}{2} + \frac{1}{3} = \frac{5}{6}, \div \frac{1}{6} = 5$$

$$6 \quad \frac{7}{3} \div \frac{66}{7} = \frac{7}{3} \times \frac{7}{66} = \frac{49}{198}$$

$$7 \quad 8\frac{1}{2} - 3\frac{2}{3} = 4\frac{1}{6}; 1\frac{2}{3} + 1\frac{1}{5} = 2\frac{13}{15}$$

$$4\frac{1}{2} \div 1\frac{2}{3} = 1\frac{1}{4}$$

$$8 \quad 4\frac{1}{2} - \frac{3}{4} = 1\frac{5}{4}; 1\frac{5}{4} \div 1\frac{1}{7} = \frac{7}{4} = 1\frac{3}{4}$$

$$9 \quad \frac{15}{2} \div \frac{15}{16} = \frac{15}{2} \times \frac{16}{15} = 8$$

$$10 \quad \frac{2}{3} + \frac{3}{4} = \frac{17}{12}; \quad \frac{5}{6} - \frac{3}{4} = \frac{1}{12}$$

$$\frac{17}{12} \div \frac{1}{12} = 17$$

$$11 \quad 8\frac{1}{2} \div 3\frac{1}{2} = \frac{17}{2} \times \frac{2}{7} = \frac{17}{7} = 2\frac{3}{7}$$

$$12 \quad \frac{1}{2} + \frac{2}{3} - \frac{3}{4} = \frac{5}{12};$$

$$\frac{5}{12} \div \frac{1}{12} = 5$$

$$13 \quad \frac{25}{2} \div 100 = \frac{1}{8}$$

$$14 \quad \frac{75}{2} \div 100 = \frac{3}{8}$$

$$15 \quad \frac{100}{3} \div 100 = \frac{1}{3}$$

$$16 \quad \frac{125}{2} \div 100 = \frac{5}{8}$$

$$17 \quad \frac{200}{3} \div 100 = \frac{2}{3}$$

$$18 \quad \frac{50}{3} \div 100 = \frac{1}{6}$$

$$19 \quad \frac{175}{2} \div 100 = \frac{7}{8}$$

$$20 \quad \frac{250}{3} \div 100 = \frac{5}{6}$$

## 138 Page 92

$$1 \quad \frac{1}{2} = \frac{1}{2} \text{ of } 125 = 25; \quad \frac{2}{3} = 6 \times 25 = 150$$

$$2 \quad \frac{1}{11} = \frac{1}{11} \text{ of } 144 = 16; \quad \frac{1}{11} = 11 \times 16 = 176$$

$$3 \quad \frac{1}{4} = \frac{1}{4} \text{ of } 321 = 107; \quad \frac{1}{4} = 4 \times 107 = 428$$

$$4 \quad \frac{2}{3} = 9 \times 45 = 405$$

$$5 \quad \frac{1}{12} = \frac{1}{12} \text{ of } 540 = 108; \quad \frac{1}{12} = 12 \times 108 = 1296$$

$$6 \quad \frac{1}{100} = \frac{1}{100} \text{ of } 642 = 6; \quad \frac{1}{100} = 100 \times 6 = 600$$

- 7  $\frac{1}{12} = \frac{1}{12}$  of 840 = 120;  $\frac{1}{12} = 12 \times 120 = 1440$
- 8  $\frac{1}{7} = 7 \times 59 = 413$
- 9  $\frac{1}{13} = \frac{1}{13}$  of 189 = 21;  $\frac{1}{13} = 13 \times 21 = 273$
- 10  $\frac{1}{11} = \frac{1}{11}$  of 910 = 91;  $\frac{1}{11} = 11 \times 91 = 1001$

## PRACTICAL FRACTIONS

140 Page 93

- 1  $\frac{1}{5}$  of \$36 = \$9;  $5 \times \$9 = \$45$
- 2  $175 \div 875 = \frac{1}{5} = \frac{1}{5}$
- 3  $\frac{1}{5}$  of 250 = 125;  $5 \times 125 = 625$  sheep
- 4  $\frac{1}{6}$  of \$1575 = \$315;  $6 \times \$315 = \$1890$
- 5  $\frac{1}{4}$  of \$12300 = \$6150;  $3 \times \$6150 = \$18450$
- 6  $\frac{1}{7}$  of \$18450 = \$2635.71;  $7 \times \$2635.71 = \$18450$
- 7  $\frac{1}{10} = \frac{1}{10}$  of 100 = 10;  $\frac{1}{10} = 10 \times 10 = 100$
- 8  $\frac{1}{4}$  of 12 = 3;  $\frac{1}{4} = 4 \times 3 = 12$
- 9  $\frac{1}{4}$  of \$75 = \$18.75;  $\frac{1}{4} = 4 \times \$18.75 = $75$  value
- $\frac{1}{4} = $18.75; \frac{1}{4} = $18.75; \frac{1}{4} = 2 \times $18.75 = $37.50$
- 10  $\frac{1}{8}$  of \$15360 = \$1920;  $\frac{1}{8} = 8 \times $1920 = $15360$
- 11  $\frac{1}{8}$  of \$15360 = \$1920;  $\frac{1}{8}$  of \$15360 = \$1920
- 12  $5 \div 65 = \frac{1}{13} = \frac{1}{13}$

$$13 \quad \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}; \quad \frac{1}{2} - \frac{1}{4} = \frac{1}{4} \text{ left}$$

$$14 \quad \frac{1}{3} \text{ of } 108 = 12; \quad 20 \times 12 = 240A.$$

$$15 \quad \frac{5}{8} - \frac{2}{8} = \frac{3}{8} = 1200. \quad \frac{1}{3} \text{ of } 1200 = 400. \quad 5 \times 400 = 2000 \text{ sheep.}$$

$$16 \quad \frac{2}{3} \text{ of } 2\frac{1}{2} = \$3$$

$$17 \quad \$2325 - \$1800 = \$525. \text{ Ans. } \frac{525}{7} = \$75$$

$$18 \quad \frac{1}{2} - \frac{1}{4} = \frac{1}{4}; \quad \frac{1}{4} \text{ of } \$1575 = \$393.75$$

$$19 \quad \frac{1}{2} \times \frac{1}{3} = \frac{1}{6} = \frac{1}{6}$$

$$20 \quad \frac{1}{2} - \frac{1}{3} = \frac{1}{6} = 8800. \quad \frac{1}{6} \text{ of } 8800 = 1466\frac{2}{3} \times 13 = 19066\frac{2}{3} \text{ men.}$$

## REVIEW IN FRACTIONS

142 Page 97

$$1 \quad \frac{3}{4} \div \frac{1}{8} = \frac{3}{4} \times \frac{8}{1} = 6 \text{ yds.}$$

$$2 \quad \frac{3}{4} \times \frac{7}{8} = \frac{21}{32} = \$431\frac{1}{4}. \quad \frac{7}{8} \times 42 = \frac{147}{4} = \$745\frac{1}{2}, \quad \$431\frac{1}{4} + \$745\frac{1}{2} = \$1176\frac{3}{4}. \quad 2\frac{3}{4}A + 2\frac{1}{4}A = 5A = 29\frac{1}{2}A.$$

$$3 \quad \frac{4}{5} \div \frac{2}{3} = \frac{4}{5} \times \frac{3}{2} = \frac{6}{5} = \$2\frac{1}{5} \text{ per yd.} \quad \frac{2}{5} \times \frac{1}{2} = \frac{1}{5} = \$31\frac{1}{5}.$$

$$4 \quad \frac{1}{3} \times \frac{2}{4} \times \frac{3}{5} \times \frac{1}{2} = 3.$$

$$5 \quad \frac{1}{2} + \frac{1}{4} = \frac{3}{4}. \quad \frac{3}{4} - \frac{1}{4} = \frac{1}{2} \text{ left.} \quad \frac{1}{2} \text{ of } 175\frac{1}{2} = 87\frac{3}{4}A. \quad 87\frac{3}{4} \times 45 = \$3948\frac{3}{4}$$

$$6 \quad 20 \times \frac{1}{5} = \$4; \quad \$4 \div \frac{1}{4} = 16 \text{ lbs.}$$

$$7 \quad \$2250 \times \frac{1}{3} = \$750.$$

$$8 \quad \frac{1408}{8} \div \frac{2}{3} = \frac{1408}{8} \times \frac{3}{2} = 61 \text{ coats.}$$

- 9  $17\frac{2}{3} + 17\frac{2}{3} + 12\frac{5}{8} + 12\frac{5}{8} = 14\frac{1}{4} \times 3\frac{1}{2} = 212\frac{1}{4}$  cts.
- 10  $18\frac{3}{4} \times 12 = 225$  ct. sugar.  $225 \div 22\frac{1}{2} = 10$  lbs. of butter.
- 11  $\frac{2}{3}$  of 475 A = 190 A B's share.  $\frac{2}{3}$  of 190 A = 76 A C's share.
- 12  $22\frac{1}{2} \div 60 = \frac{1}{2} \times \frac{1}{60} = \frac{1}{120}$
- 13  $17\frac{1}{2} + 3\frac{1}{2} + 7\frac{1}{2} + 5\frac{1}{2} = \$33\frac{1}{2}$ .  $\$63\frac{1}{2} - \$33\frac{1}{2} = \$29\frac{1}{2}$ .
- 14  $104\frac{1}{2} \div 5\frac{1}{2} = 20\frac{2}{5} \times \frac{1}{11} = 19$  rds.
- 15  $320 \times \frac{1}{2} = 1760$  yds.
- 16  $517\frac{2}{10} - 27\frac{6}{10} = \$490\frac{2}{10}$ .
- 17  $7\frac{1}{2} \div \frac{2}{10} = \frac{1}{2} \times \frac{10}{2} = 8$  lots.
- 18  $7\frac{1}{2} \div \frac{2}{3} = \frac{1}{2} \times \frac{3}{2} = 12\frac{1}{2}$  yds.
- 19  $99 \div 3\frac{3}{4} = 27$  cts. per lb.  $\frac{2}{3}$  of 27 cts. =  $20\frac{1}{2}$  cts.
- 20  $19 \times \frac{1}{20} = \frac{19}{20} = 18\frac{1}{20}$  tons.
- 21  $14 \div 7\frac{1}{8} = 14 \times \frac{8}{57} = 1\frac{6}{19} = \$1\frac{6}{19}$ .
- 22  $\frac{1}{10} + \frac{1}{15} = \frac{1}{6}$ ;  $\frac{1}{6}$  of  $\frac{2}{3} = \frac{1}{9}$ ;  $\frac{2}{3} - \frac{1}{9} = \frac{5}{9}$ .
- 23  $\frac{1}{15}$  of 324 = 18.  $18 = \frac{1}{15}$ ;  $\frac{1}{15}$  of 18 = 9.  $9 \times 19 = 171$  cattle B's
- 24  $\frac{1}{11}$  of 4774 = \$1302. A's share.  $\frac{2}{11}$  of \$4774 = \$1953 B's share.  
 $\$4774 - (1302 + 1953) = \$1519$  C's share
- 25  $2\frac{7}{8} + 2\frac{1}{8} + \frac{1}{8} = 4\frac{1}{2}$ .  $60\frac{1}{2} \div 4\frac{1}{2} = 10$  suits.  $1\frac{1}{4}$  yds. rem.  $1\frac{1}{4} \div \frac{1}{8} = 2$

26 In one day A will do  $\frac{1}{12}$  of the work, and B  $\frac{1}{14}$

" " A & B will do  $\frac{1}{12} + \frac{1}{14} = \frac{5}{42}$ .  $182 \div 27 = 6\frac{2}{3}$  days

27  $6\frac{1}{2} \div 5\frac{1}{2} = \frac{13}{10} \times \frac{1}{11} = \frac{13}{110}$  cost per cental.  $12\frac{1}{2} \div \frac{1}{10} = \frac{25}{1} \times \frac{1}{11} = 11$  centals

28  $\frac{3}{4} + \frac{1}{8} = \frac{7}{8}$ .  $\frac{3}{4} - \frac{1}{8} = \frac{5}{8}$  left.  $150 = \frac{5}{8}$ ;  $\frac{3}{4} = 150 \times \frac{2}{5} = 720$  hogs

29  $127\frac{1}{2} \times 1\frac{1}{2} = \$150$  wheat.  $18 \times 1\frac{1}{2} = \$22\frac{1}{2}$  oats.  $75 \times \frac{1}{2} = \$71\frac{1}{2}$  barley.  $\$153 + \$22\frac{1}{2} + \$71\frac{1}{2} = \$246\frac{1}{2}$  total value.

30  $321 \div 4 = \$80\frac{1}{4}$  per A.  $11\frac{5}{8} \times \$80\frac{1}{4} = \frac{221}{8} \times \frac{101}{4} = \$907\frac{1}{8}$ .

31  $1 \div 47\frac{2}{3} = 1 \times \frac{3}{141} = \frac{1}{47}$ .

32  $35 \times 1\frac{2}{3} = \$66\frac{2}{3}$  carpet.  $3 \times \frac{1}{2} = \$2\frac{1}{2}$  curtains.  $5 \times \frac{1}{2} = \$3\frac{1}{2}$  chairs.  $\$66\frac{2}{3} + \$2\frac{1}{2} + \$3\frac{1}{2} = \$72\frac{1}{3}$ .

33  $22 \text{ mi.} \times \frac{1}{4} = 5\frac{1}{2} \text{ hrs.}$ , A's time.  $22 \text{ mi.} \times \frac{1}{11} = 2 \text{ hrs.}$  B's time. B travels 1 mi. in  $\frac{1}{11}$  hrs., in 1 hr. he travels  $\frac{1}{11}$  mi. in  $\frac{1}{11}$  hr.  $\frac{1}{2}$  of  $\frac{1}{11} = \frac{1}{22}$  mi. behind A.

34 In one day A and B do  $\frac{1}{6}$  of the work; A and C,  $\frac{1}{8}$ ; and B and C,  $\frac{1}{12}$ ; All will do  $\frac{1}{2}$  of the sum of  $\frac{1}{6} + \frac{1}{8} + \frac{1}{12} = \frac{1}{2}$  of work in one day, or 8 days to complete work. Since B and C do  $\frac{1}{12}$  in a day, A will do  $\frac{1}{2} - \frac{1}{12} = \frac{5}{12}$ .  $120 \div 7 = 17\frac{1}{7}$  da. A. Since A and C do  $\frac{1}{8}$  in a day, B will do  $\frac{1}{2} - \frac{1}{8} = \frac{3}{8}$ . in 1 da., or all in 24 days, B. Since A and B do  $\frac{1}{6}$  in a day C will do  $\frac{1}{2} - \frac{1}{6} = \frac{1}{3}$  in 1 day, or all in 40 days, C.

35  $49\frac{1}{2}A - 9\frac{1}{2}A = 39\frac{1}{2}A$ .  $\$3190 \div 39\frac{1}{2} = 3190 \times \frac{2}{79} = \$80$ .

36  $\$20 \div 33\frac{1}{3} = 20 \times \frac{3}{100} = \frac{6}{10} = \frac{3}{5}$ .

- 37  $\frac{1}{2} \div 2\frac{1}{4} = \frac{1}{2} \times \frac{4}{9} = \frac{2}{9}$  yards.
- 38  $169 \div 3\frac{1}{3} = 169 \times \frac{3}{10} = 52$  sheep.
- 39  $3\frac{2}{3} \div \frac{2}{10} = \frac{10}{3} \times \frac{10}{2} = 4$  children.
- 40  $23\frac{3}{4} \div \frac{1}{10} = \frac{95}{4} \times \frac{10}{1} = \$76.$
- 41  $62\frac{1}{2} \div 50 = \frac{125}{2} \times \frac{1}{50} = \frac{5}{2}$  per sack.  $12 \times \frac{5}{2} = \$15.$
- 42  $\frac{1}{2} + \frac{1}{10} = \frac{6}{10}$  spent.  $\frac{70}{10} - \frac{6}{10} = \frac{64}{10}$  saved.  $106 = \frac{53}{5}$ .  $\frac{70}{5} = 106 \times \frac{5}{5} = \$140.$
- 43  $\frac{2}{3}$  of B's +  $\frac{1}{3}$  of B's =  $\frac{1}{2}$  of B's = \$1728.  $1728 \div \frac{1}{2} = \$1296$  B's money.  $\frac{1}{3}$  of \$1296 = \$432 A's money.
- 44  $17\frac{1}{2} \times 5\frac{1}{5} \times 18\frac{3}{4} = \frac{35 \times 26 \times 75}{2 \times 5 \times 4} = \frac{6825}{4} = \$1706\frac{1}{4}$
- 45  $81\frac{1}{3} \div \frac{2}{3} = \frac{244}{3} \times \frac{3}{2} = 122$  dipperfuls
- 46  $588 \div 24\frac{1}{2} = 24$  cattle.  $\$27\frac{1}{2} - \$24\frac{1}{2} = \$3\frac{1}{2}$  gain on each.  $\$3\frac{1}{2} \times 24 = \$78$  total gain.
- 47  $3\frac{1}{3} + 5\frac{7}{10} = 9\frac{1}{2}$ .  $9\frac{1}{2} \div \frac{1}{37} = \frac{37}{2} \times \frac{37}{2} = \frac{1369}{2} = 85\frac{9}{10}.$
- 48 Let  $\frac{2}{3}$  = C's share; then A's =  $\frac{2}{3}$  of C's, and B's twice  $\frac{2}{3}$ , or  $\frac{4}{3}$  of C's.  $\frac{2}{3} + \frac{2}{3} + \frac{4}{3}$ , or  $\frac{8}{3}$  of C's share = \$2835.  $\frac{2}{3} = \frac{1}{4}$  of \$2835 = \$315.  $\frac{2}{3} = 2 \times \$315 = \$630$  A's share,  $\frac{4}{3} = 4 \times \$315 = \$1260$  B's share.  $\frac{8}{3} = 3 \times \$315 = \$945$  C's share.
- 49  $\frac{1}{3}$  of  $1\frac{2}{3}$  = 40 lbs.  $\$34 \div 40 = \$.85$  per lb.



- 50 Let A's =  $\frac{1}{3}$ , then B's =  $\frac{1}{3}$  of A's, and C's  $\frac{1}{3}$  of  $\frac{1}{3}$  =  $\frac{1}{9}$  of A's.  
 $\frac{1}{3} + \frac{1}{3} + \frac{1}{9}$ , or  $\frac{5}{9}$  of A's = \$1530.  $\frac{1}{3} = \frac{1}{15}$  of \$15300 = \$1020.  
 $3 \times \$1020 = \$3060$  A's money;  $5 \times \$1020 = \$5100$  B's money;  
 $7 \times \$1020 = \$7140$  C's money.
- 51  $5\frac{1}{2} \div \frac{2}{3} = \$\frac{15}{2}$  cost of one cord.  $17\frac{1}{2} \times \frac{3}{4} = 11\frac{3}{4} = \$144\frac{3}{4}$  total cost.
- 52  $35\frac{1}{3} + 47\frac{1}{3} + 17\frac{1}{3} = 100\frac{1}{3}$  A,  $100\frac{1}{3} \times 40 = \$4036\frac{1}{3}$  Am't rec'd
- 53  $1000 \div 1\frac{1}{4} = 1000 \times \frac{4}{5} = 800$  cents.
- 54  $\frac{1}{3} + \frac{7}{8} = 1\frac{1}{24}$  Sum.  $\frac{7}{8} - \frac{1}{3} = \frac{1}{24}$  Diff.  $\frac{1}{3} \times \frac{7}{8} = \frac{7}{24}$  Product.
- 55  $5\frac{1}{2} \times 40 = 220$  cts. for butter;  $10\frac{1}{2} \times 18 = 186$  cts. for eggs;  
 $220$  cts. +  $186$  cts. =  $406$  cts for both.  $406 \text{ cts.} \div 7\frac{1}{4} = 406 \times \frac{4}{29} = 56$  lbs.
- 56  $\$41\frac{1}{10} - \$3\frac{1}{2} = \$37\frac{1}{2}$ .  $\$37\frac{1}{2} \div 12\frac{1}{2} = \frac{7}{2} \times \frac{2}{5} = \$3$ .
- 57  $8\frac{1}{2} \times \$15 = 127\frac{1}{2}$  cost of coal.  $9\frac{3}{4} \times 7\frac{1}{2} = \$72\frac{1}{2}$  cost of wood.  
 $\$127\frac{1}{2} + \$72\frac{1}{2} = \$200$  total cost.
- 58  $40 \times \$63 = \$2520$  cost.  $\frac{1}{15}$  of  $40$  A.  $\times \$72 = \$900$ .  $\frac{2}{5}$  of  $40$  A.  $\times$   
 $\$59\frac{1}{2} = \$357$ .  $21\frac{1}{2}$  A  $\times \$65\frac{1}{2} = \$1408\frac{1}{2}$ .  $\$900 + \$357 + \$1408\frac{1}{2} =$   
 $\$2665\frac{1}{2}$  total receipts.  $\$2665\frac{1}{2} - \$2520 = \$145\frac{1}{2}$  gain.
- 59  $\frac{1}{2}$  of  $189 = 81$ .  $81 \div 567 = \frac{1}{7}$  Ans.
- 60 Let  $1 =$  A's loan, then will  $2 =$  B's, and  $3$  the total loan.  
A paid back  $\frac{1}{2}$  of  $1 = \frac{1}{2}$ . B paid  $\frac{1}{2}$  of  $2 = 1$ . Total pay-  
ments =  $1\frac{1}{2}$ , or  $\frac{1}{2}$  of the whole.  $\$150 = \frac{1}{2}$ , total loan =  $\$300$ ,  
of which A had  $\frac{1}{3}$ , or  $\$100$ , and B  $\frac{2}{3}$ , or  $\$200$ .

- 61  $35\frac{1}{2} \times 47\frac{3}{4} = 7\frac{1}{2} \times 1\frac{1}{4} = 10\frac{1}{4} = 10\frac{1}{4} \times 4 = 40\frac{1}{2} = 1092\frac{1}{2}$  yds.
- 62  $40 \times 2\frac{7}{10} = 94$  cwt.
- 63  $94 \text{ cwt.} \div 20 = 4\frac{7}{10}$  T.
- 64  $365\frac{1}{2} \times 24 = 8766$  hours.
- 65  $14 \times \$23\frac{1}{2} = \$329$  cost of cows.  $11 \times \$85\frac{1}{2} = \$943\frac{1}{2}$  cost of horses.  
 $50 \times \$2\frac{3}{4} = \$137\frac{1}{2}$  cost of sheep.  $\$329 + \$943\frac{1}{2} + \$137\frac{1}{2} = \$1409\frac{1}{2}$ .  
 total cost.  $\$1500 - \$1409\frac{1}{2} = \$90\frac{1}{2}$  left.
- 66  $\frac{1}{10}$  of 15 =  $\$1\frac{1}{2}$  gain.  $\$12\frac{1}{2}$  cost +  $\$1\frac{1}{2}$  gain =  $\$14\frac{1}{2}$  S. P.
- 67  $9\frac{3}{8} = \frac{45}{8}$ .  $\frac{45}{8} \times \frac{5}{5} = \frac{225}{40}$ ; 533 mi. =  $\frac{533}{1}$  of distance to San José  
 $533 \div \frac{533}{1} = 1$  mi. to San José. 533 mi. - 50 mi. = 483 mi. to  
 Los Angeles.
- 68 For every day the first worked, the second worked three days, and the third two days,  $1 + 3 + 2 = 6$  parts to the work.  
 $\$12.30 \div 6 = \$2.05$  one part, or share of first;  $3 \times \$2.05 = \$6.15$  share of second;  $2 \times \$2.05 = \$4.10$  share of third.
- 69  $3\frac{1}{2} + 3\frac{3}{8} = 6\frac{7}{8}$  mi. apart in one hour.  $6\frac{7}{8} \times 13\frac{3}{4} = 93\frac{3}{4}$  mi.  
 total distance.
- 70  $3\frac{1}{2} - 3\frac{3}{8} = \frac{1}{8}$  mi. in 1 hr.  $\frac{1}{8}$  of  $13\frac{3}{4} = 1\frac{1}{4}$  mi. total distance.
- 71  $2483\frac{1}{4} \div 225\frac{1}{4} = \frac{9933}{900} \times \frac{4}{9} = 11$  bbl.
- 72  $2\frac{1}{4} \div \frac{2}{3} = \frac{2}{4} \times \frac{3}{2} = 6$  collars.
- 73  $81\frac{1}{8} + 98\frac{1}{8} + 105\frac{1}{8} + 112\frac{1}{8} = \$398\frac{1}{8}$  total value.  $398\frac{1}{8} \div 4 =$   
 $\$99\frac{7}{16}$  average value.
- 74  $35 \times \$15\frac{1}{2} = \$542\frac{1}{2}$  C. +  $\$17\frac{1}{2}$  G. =  $\$560$  S. P.  $560 \div 35 = \$16$  each.
- 75  $\frac{1}{3}$  of 375 = 125 oranges.  $\frac{1}{5}$  of 375 = 75 oranges.  $375 - 175 = 200$ ,  $\times 1\frac{1}{2}$  cts. = 300 cts.

- 76  $30\frac{1}{2} + 42\frac{1}{2} = 72\frac{2}{2}$  yds.  $241\frac{1}{2} \div 72\frac{2}{2} = \$3\frac{1}{2}$  per yard
- 77  $\frac{1}{2} + \frac{1}{2} = \frac{2}{2}$  of dist. W. traveled.  $\frac{1}{2} = \frac{1}{2}$  of  $5\frac{1}{2} = \frac{11}{2}$  mi.  $4 \times \frac{1}{2} = 2\frac{1}{2}$  mi.  
dist. R. traveled.  $5 \times \frac{1}{2} = 3$  mi. dist. W. traveled.
- 78  $365 - 60 = 305$  days.  $305 \times \frac{1}{4} = \$228\frac{1}{4}$ .
- 79  $28\frac{3}{4} \div 11\frac{1}{2} = 1\frac{1}{2} \times \frac{2}{2} = \frac{3}{2}$  per box.  $22\frac{1}{2} \div \frac{1}{2} = 4\frac{1}{2} \times \frac{2}{2} = 9$  boxes.
- 80  $2\frac{1}{2} \times \frac{1}{4} = \frac{1}{2}$ .  $\frac{1}{2} + \frac{1}{2} = 1\frac{1}{2}$  of Frank's.  $\frac{1}{2} = 24\frac{1}{2}$ ;  $\frac{1}{8} = \frac{1}{8}$  of  $\$24\frac{1}{2} = \$\frac{3}{2}$ .  $33 \times \frac{1}{2} = \$16\frac{1}{2}$  Fred's share.  $16 \times \frac{1}{2} = \$8$  Frank's share.

## DECIMAL FRACTIONS

154 Page 108

$$\begin{array}{r}
 1 \quad 75.14000 \\
 .12500 \\
 131.13100 \\
 .07850 \\
 7.00700 \\
 .13147 \\
 1389.90000 \\
 .00910 \\
 \hline
 1603.52207
 \end{array}$$

$$\begin{array}{r}
 2 \quad 857.14000 \\
 85.07140 \\
 .07408 \\
 .00291 \\
 405.01000 \\
 78.78000 \\
 2.04040 \\
 7814.00200 \\
 \hline
 9242.12079
 \end{array}$$

$$\begin{array}{r}
 3 \quad 7.070700 \\
 20.000300 \\
 171.411200 \\
 27141.750000 \\
 480.700000 \\
 526.114000 \\
 .070107 \\
 .141000 \\
 \hline
 28347.257307
 \end{array}$$

$$\begin{array}{r}
 4 \quad 82.10730 \\
 1.01010 \\
 3150.07100 \\
 4090.07000 \\
 293.02930 \\
 47.14100 \\
 29.64100 \\
 10.10000 \\
 \hline
 7703.1697
 \end{array}$$

5	75.140 131.131 7.007 <u>1389.9</u> 1603.178	11	405.01 171.4112 82.1073 <u>29.641</u> 688.1695
6	.125 .0785 .13147 .0091 <u>.34407</u>	12	78.78 27141.75 1.01010 <u>10.1</u> 27231.6401
7	857.14 2 0404 480.7 3150.071 4489.9514	13	25.25 9.114 7.5 11.008 <u>52.872</u>
8	85.0714 7814.002 526.114 4090.07 <u>12515.2574</u>	14	74.0099 11.00045 .004 .04 <u>85.05435</u>
9	.07408 7.0707 .070107 293.0293 <u>300.244187</u>	15	.75 .0075 40.40 4000.004 <u>4041.1615</u>
10	.00291 20.0003 .1410 47.141 <u>67.28521</u>	16	.91 9.1 .4 1.21 <u>11.62</u>
		7	9. .057 5.011 72.6 <u>86.668</u>

50

## DECIMAL FRACTIONS

18

$$\begin{array}{r} 87.54 \\ 90.8 \\ 117.041 \\ 25.009 \\ \hline 320.39 \end{array}$$

19

$$\begin{array}{r} 238.012 \\ 171.125 \\ 328.01 \\ 190.008 \\ \hline 927.155 \end{array}$$

20

$$\begin{array}{r} .2 \\ 2.4 \\ 12. \\ 17.5 \\ \hline 32.1 \end{array}$$

21

$$\begin{array}{r} 8.3 \\ 3.75 \\ .57 \\ .09 \\ \hline 12.71 \end{array}$$

22

$$\begin{array}{r} 2.496 \\ 7.125 \\ .0125 \\ .025 \\ \hline 9.6585 \end{array}$$

155 Page 108

1

$$\begin{array}{r} 75.14 \\ .125 \\ \hline 75.015 \end{array}$$

6

$$\begin{array}{r} 857.14 \\ 78.78 \\ \hline 778.36 \end{array}$$

2

$$\begin{array}{r} 857.14 \\ 85.0714 \\ \hline 772.0686 \end{array}$$

7

$$\begin{array}{r} 20.0003 \\ 7.0707 \\ \hline 12.9296 \end{array}$$

3

$$\begin{array}{r} 857.14 \\ .07408 \\ \hline 857.06592 \end{array}$$

8

$$\begin{array}{r} 171.4112 \\ 7.0707 \\ \hline 164.3405 \end{array}$$

4

$$\begin{array}{r} 857.14 \\ .00291 \\ \hline 857.13709 \end{array}$$

9

$$\begin{array}{r} 27141.75 \\ 7.0707 \\ \hline 27134.6793 \end{array}$$

5

$$\begin{array}{r} 857.14 \\ 405.01 \\ \hline 452.13 \end{array}$$

10

$$\begin{array}{r} 82.1073 \\ 1.0101 \\ \hline 81.0972 \end{array}$$

158 Page 109

$$\begin{array}{r}
 1 \quad 75.14 \\
 \underline{75.14} \\
 30056 \\
 7514 \\
 37570 \\
 \underline{52598} \\
 5646.0196
 \end{array}$$

$$\begin{array}{r}
 2 \quad .125 \\
 75.14 \\
 \underline{500} \\
 125 \\
 625 \\
 \underline{875} \\
 9.39250
 \end{array}$$

$$\begin{array}{r}
 3 \quad 131.131 \\
 \underline{75.14} \\
 524524 \\
 131131 \\
 655655 \\
 \underline{917917} \\
 9853.18334
 \end{array}$$

$$\begin{array}{r}
 4 \quad .0785 \\
 75.14 \\
 \underline{3140} \\
 785 \\
 3925 \\
 \underline{5495} \\
 5.898490
 \end{array}$$

$$\begin{array}{r}
 5 \quad 7.007 \\
 75.14 \\
 \underline{28028} \\
 7007 \\
 35035 \\
 \underline{49049} \\
 526.50598
 \end{array}$$

$$\begin{array}{r}
 6 \quad .13147 \\
 \underline{75.14} \\
 52588 \\
 13147 \\
 65735 \\
 \underline{92929} \\
 9.8786558
 \end{array}$$

$$\begin{array}{r}
 7 \quad 1389.9 \\
 \underline{75.14} \\
 55596 \\
 13899 \\
 69495 \\
 \underline{97293} \\
 104437.086
 \end{array}$$

$$\begin{array}{r}
 8 \quad .0091 \\
 \underline{75.14} \\
 364 \\
 91 \\
 455 \\
 \underline{637} \\
 .683774
 \end{array}$$

$$\begin{array}{r}
 9 \quad 75.14 \\
 \underline{1.25} \\
 37570 \\
 \underline{90168} \\
 9.39250
 \end{array}$$

$$\begin{array}{r}
 10 \quad .125 \\
 \underline{.125} \\
 625 \\
 \underline{1500} \\
 .015625
 \end{array}$$

$$\begin{array}{r}
 11 \quad 131.131 \\
 \quad .125 \\
 \hline
 \quad 655655 \\
 \quad 1573572 \\
 \hline
 16.391375
 \end{array}$$

$$\begin{array}{r}
 12 \quad .0785 \\
 \quad .125 \\
 \hline
 \quad 3925 \\
 \quad 9420 \\
 \hline
 .0098125
 \end{array}$$

$$\begin{array}{r}
 13 \quad 7.007 \\
 \quad .125 \\
 \hline
 \quad 35035 \\
 \quad 84084 \\
 \hline
 .875875
 \end{array}$$

$$\begin{array}{r}
 14 \quad .13147 \\
 \quad .125 \\
 \hline
 \quad 65735 \\
 \quad 157764 \\
 \hline
 .01643375
 \end{array}$$

$$\begin{array}{r}
 15 \quad 1389.9 \\
 \quad .125 \\
 \hline
 \quad 69495 \\
 \quad 166788 \\
 \hline
 173.7375
 \end{array}$$

$$\begin{array}{r}
 16 \quad .0091 \\
 \quad .125 \\
 \hline
 \quad 455 \\
 \quad 1092 \\
 \hline
 .0011375
 \end{array}$$

$$\begin{array}{r}
 17 \quad 857.14 \\
 \quad 131.131 \\
 \hline
 112397.62534
 \end{array}$$

$$\begin{array}{r}
 18 \quad 85.0714 \\
 \quad 131.131 \\
 \hline
 11155.4977534
 \end{array}$$

$$\begin{array}{r}
 19 \quad .07408 \\
 \quad 131.131 \\
 \hline
 9.71418448
 \end{array}$$

$$\begin{array}{r}
 20 \quad .00291 \\
 \quad 131.131 \\
 \hline
 .38159121
 \end{array}$$

$$\begin{array}{r}
 21 \quad 405.01 \\
 \quad 131.131 \\
 \hline
 53109.36631
 \end{array}$$

$$\begin{array}{r}
 22 \quad 78.78 \\
 \quad 131.131 \\
 \hline
 10330.50018
 \end{array}$$

$$\begin{array}{r}
 23 \quad 2.0404 \\
 \quad 131.131 \\
 \hline
 267.5596924
 \end{array}$$

$$\begin{array}{r}
 24 \quad 7814.002 \\
 \quad 131.131 \\
 \hline
 1024657.896262
 \end{array}$$

$$25 \quad 857.14 \times .0785 = 67.28549$$

$$26 \quad 85.0714 \times \text{"} = 6.67810490$$

$$27 \quad .07408 \times \text{"} = .005815280$$

$$28 \quad .00291 \times \text{"} = .000228435$$

$$29 \quad 405.01 \times \text{"} = 31.793285$$

**30**  $78.78 \times .0785 = 6.184230$

**31**  $2.1404 \times .0785 = .1601714$

**32**  $7814.002 \times .0785 =$   
 $613,3991570$

**33**  $7.0707 \times 7.007 =$   
 $49.5443949$

**34**  $20.0003 \times 7.007 =$   
 $140.1421021$

**35**  $171.4112 \times 7.007 =$   
 $1201.0782784$

**36**  $27141.75 \times 7.007 =$   
 $190182.24225$

**37**  $480.7 \times 7.007 =$   
 $3368.2649$

**38**  $526.114 \times 7.007 =$   
 $3686.480798$

**39**  $.070107 \times 7.007 =$   
 $.491239749$

**40**  $1410 \times 7.007 =$   
 $.9879870$

**41**  $7.0707 \times .13147 =$   
 $.929584929$

**42**  $20.0003 \times .13147 =$   
 $2.629439441$

**43**  $171.4112 \times .13147 =$   
 $22.535430464$

**44**  $27141.75 \times .13147 =$   
 $3568.3258725$

**45**  $.13147 \times 480.7 =$   
 $63.197629$

**46**  $526.114 \times .13147 =$   
 $69.16820758$

**47**  $.070107 \times .13147 =$   
 $.00921696729$

**48**  $.1410 \times .13147 =$   
 $.018537270$



49  $82.1073 \times 1389.9 =$

114120.93627

50  $101010 \times 1389.9 =$

1403.93799

51  $3150.071 \times 1389.9 =$

4378283.6827

52  $4090.07 \times 1389.9 =$

5684788.293

53  $293.0293 \times 1389.9 =$

407281.42407

54  $47.141 \times 1389.9 =$

65521.2759

55  $29.641 \times 1389.9 =$

41198.0259

56  $10.1 \times 1389.9 =$

14037.99

57  $82.1073 \times .0091 =$

.74717643

58  $1.01010 \times .0091 =$

.009191910

59  $3150.071 \times .0091 =$

28.6656461

60  $4090.07 \times .0091 =$

37.219637

61  $293.0293 \times .0091 =$

2.66656663

62  $47.141 \times .0091 =$

.4289831

63  $29.641 \times .0091 =$

.2697331

64  $10.1 \times .0091 =$

.09191

## 160 Page 109

- |    |  |    |                                     |
|----|--|----|-------------------------------------|
| 1  | $725 \times .06 = 43.5$                        | 11 | $57.75 \times \frac{1}{25} = 2.31$  |
| 2  | $42.5 \times .8 = 34$                          | 12 | $1.044 \times .9 = 9.396$           |
| 3  | $7.84 \times .125 = .98$                       | 13 | $72400 \times \frac{1}{100} = 4525$ |
| 4  | $17.28 \times .03 = .5184$                     | 14 | $245.4 \times .15 = 36.81$          |
| 5  | $4.096 \times .12\frac{1}{2} = .512$           | 15 | $3.55 \times .8 = 2.84$             |
| 6  | $256 \times .16\frac{2}{3} = 42.66\frac{2}{3}$ | 16 | $96 \times \frac{1}{40} = 2.8$      |
| 7  | $2.444 \times \frac{1}{4} = .611$              | 17 | $250 \times .28 = 70$               |
| 8  | $515.1 \times \frac{1}{3} = 171.7$             | 18 | $1400 \times 1.05 = 1470$           |
| 9  | $480 \times \frac{1}{10} = 24$                 | 19 | $380 \times 1.2 = 456$              |
| 10 | $.764 \times .175 = .1337$                     | 20 | $920 \times .45 = 414$              |

## 162 Omitted

## PRACTICAL WORK IN DECIMALS

## 168 Page 113

- 1  $240.25 \times .63 = 151.3575$  bales.
- 2  $475 \text{ lbs.} \times .63 = 299.25 \text{ lbs.}$
- 3  $17.6 + 23.25 + 42.625 = 83.475 \text{ A.}$       $83.475 \times \$40 = \$3,339.$

- 4 .2 of .3125 = .0625 sold. .3125 - .0625 = .25 left
- 5  $36 \times \$1.12\frac{1}{2} = \$4.50$
- 6  $648.96 \div 8 = 81.12$  A.
- 7  $27 \div 2.25 = 12$  books
- 8  $6.75 \text{ mi.} \times 11 = 74.25 \text{ mi.}$
- 9  $2150.42 \times 5.16\frac{1}{2} = 11110.50\frac{1}{2} \text{ cu. in.}$
- 10  $\$1.37\frac{1}{2} \times 296 = \$407$
- 11  $272.25 \text{ ft.} \div 16.5 \text{ ft.} = 16.5 \text{ rd.}$
- 12 Their sum, or 187.46 mi.
- 13  $187.46 \text{ mi.} \div 6 = 31.24\frac{1}{2} \text{ mi.}$
- 14  $278.15 + 392.14 + 171.9 + 429.51 + 530.875 = 1802.575 \text{ A.}$   
 $3218 \text{ A.} - 1802.575 \text{ A.} = 1415.42\frac{1}{2} \text{ A.}$
- 15  $42 \div 2.625 = 16$  pairs
- 16  $231 \text{ cu. in.} \times 31.5 = 7276.5 \text{ cu. in.}$
- 17  $(32.0625 + 28.4375) \times 2 = 121 \text{ rds. around}$
- 18  $5280 \text{ ft.} \div 21.96 \text{ ft.} = 240.43 \text{ turns}$
- 19  $12 \times \$81.875 = \$982.50 \text{ cost.}$   
 $\$1000 - \$982.50 = \$17.50 \text{ left}$
- 20  $\$.162.75 \div \$7.75 = 21 \text{ cords}$

- 21  $7.231 \text{ A.} + 9.124 \text{ A.} + 6.715 \text{ A.} = 23.07 \text{ A.} \div 3 = 7.69 \text{ A.}$   
 $23.07 \text{ A.} + 7.69 \text{ A.} = 30.76 \text{ A.}$
- 22  $30.76 \times \$50 = \$1538.$
- 23  $.08 + .16 + .5 = .74$  spent;  $1.00 - .74 \div .26$  left.  
 $.26 = \$26$ , the whole  $= \$26 \div .26 = \$100.$
- 24  $.33\frac{1}{3} + .45 = .78\frac{1}{3}.$   $1.00 - .78\frac{1}{3} = .21\frac{2}{3}.$
- 25  $15.87\frac{1}{2} + 17.66\frac{2}{3} + 14.33\frac{1}{3} + 15.12\frac{1}{2} = 63$  cords.
- 26  $63 \times \$7\frac{4}{7} = \$477.$
- 27  $4\frac{1}{4} \times 8 = 38$  mi.  $38 \div .59375 = 64$  times.
- 28  $(15\frac{1}{16} + 10.1875) \times 2 = 51$  rds. around.  
 $51 \times 3 = 153$  rds. of rail;  $153 \times 16\frac{1}{2} = 2524\frac{1}{2}$  ft.  
 $2524.5 \div 7.5 = 336.6$  rails.
- 29 Their sum  $= 112.241$  in.  $\div 5 = 22.4482$  in. average
- 30  $2.125 \text{ gal.} \times 60 = 127\frac{1}{2}$  gal.
- 31  $17.125 = \$9.60 = \$164.40.$
- 32  $4.64 \text{ mi.} + 5.16 \text{ mi.} = 9.8 \text{ mi.}$  distance apart in one hour.  
 $9.8 \text{ mi.} \times 13 = 127.4 \text{ mi.}$  total distance apart.
- 33  $107.8 \text{ mi.} \div 9.8 \text{ mi.} = 11$  hrs.
- 34  $48 \times 3.1416 = 150.7968$  sec.
- 35  $8000 \times 3.1416 = 25132.8$  mi.

## 172 Page 121

1

To 5 yds. Ribbon . @ .12½		62½		
" 11 " Bl'k Casm're " 1.60	17	60		
" 4 doz. Buttons . " .30	1	20		
" 2 yds. Silesia . " .20		40		
" 10 yds. Sheeting " .18	1	80		
" 1 pr. Gaiters, .	3	50	25	12½

2

To 5 gals. Kerosene Oil @ .25	1	25		
" 3 prs. Blankets . " 6.50	19	50		
" 25 lbs. Brown Sugar " .07	1	75		
" 3 doz. Eggs . . " .20		60		
" 1 Turkey, 12 lbs. " .22	2	64		
" 50 lbs. Potatoes . . " .01½		75	26	49

3

1880							
Mar.	3	To 2 lbs. Steak . @ .12½		25			
"	4	" 4½ lbs. Roast Beef " .12		54			
"	5	" 1½ lbs. Sirloin " .15		26½			
"	6	" 5½ lbs. Mutton " .10		55			
"	8	" 1 A&CHam, 15 lbs " .19	2	85			
"	10	" 3 lbs. Veal Roast " .14		42	4	87½	

4

PETALUMA, JULY 17, 1888.

Mr. M. S. JOHNSON,

To JOHN SMITH, Dr.

5

To Services, 12 da. @ \$1.50	18	00		
To ½ doz. Wooden Chairs @ \$1.	6	00		
" 1 Lounge,	12	50		
" 1 Bed Room Set,	22	75		
" 3 Fancy Chairs @ \$2.25	6	75		
" 1 Extension Table,	7	50		
" 1 Center Table,	4	00	59	50

## BILLS

59

6

SAN FRANCISCO, JULY 19, 1888

MR. GEO. SIMS,

To S. WILSON, Dr.

7	To 10 tons Hay, @ \$10.00		100	00		
	To 8 doz. Oranges, @	.15	1	20		
	" 10 lbs. Nuts, "	.10	1	00		
	" 8 Lemons, "	.02½		20		
	" 5 lbs. Mixed Candy "	.20	1	00		
	" 1 box Apples, "		1	00		
	" 7 boxes St'wb'r's, "	.45	3	15	7	55

8

	To 12 Pencils, @	.05		60		
	" 1 ream Note Paper, "			40		
	" 4 Note Books, @	.10		40		
	" 1 Rubber Eraser, "			05		
	" 1 pkg. Envelopes, "			10		
	" 2 Fifth Readers, @	.85	1	70		
	" 2 School Geog., @ 1	.40	2	80	6	05

9

	To 14 yds. Print, @	.12	1	68		
	" 3 lbs. Butter, "	.28		84		
	" 4 bars Soap, "	.10		40		
	" 1 pr. Child's Shoes, "		1	75		
	" 25 lbs. Flour, @	.02½		62½		
	" 1 can Lard, "			65		
	" 2 lbs. Cheese, "	.17		34	6	28½

## PART II.

## WEIGHTS AND MEASURES

## Linear Measure

174 page 123

- 30**  $3 \text{ mi.} \times 320 + 2 \text{ rds.} = 962 \text{ rds.}, \times 5\frac{1}{2} + 4\frac{1}{2} \text{ yds.}, = 5295.66\frac{1}{2} \text{ yds.},$   
 $\times 36 = 15.887 \text{ ft}$
- 31**  $3 \text{ yds.} \times 36 + 2 \text{ in.} = 110 \text{ in.}$   $110 \text{ in.} \div 36 = 3.05\frac{1}{2} \text{ yds.}$
- 32**  $1 \text{ mi.} \times 320 + 2 \text{ rds.} = 322 \text{ rods.}, \times 16\frac{1}{2} + 2 \text{ ft.} = 5315 \text{ ft.}$   
 $5315 \text{ ft.} \div 5280 = 1.0066 \text{ mi.}$
- 33**  $3 \text{ rds.} \times 5\frac{1}{2} + 4 \text{ yds.} = 20\frac{1}{2} \text{ yds.}, \times 3 + 2 \text{ ft.} = 63\frac{1}{2} \text{ ft.}, \times 12 + 2 \text{ in.} =$   
 $768 \text{ in.}$   $768 \text{ in.} \div 12 = 64 \text{ ft.}$
- 34**  $2 \text{ rds.} \times 5\frac{1}{2} + 1 \text{ yd.} = 12 \text{ yds.}, \times 3 + 2 \text{ ft.} = 38 \text{ ft.}, \times 12 + 6 \text{ in.} =$   
 $462 \text{ in.}$   $462 \text{ in.} \div 12 = 38.5 \text{ ft.}$
- 35**  $1 \text{ mi.} \times 320 + 2 \text{ rds.} = 322 \text{ rds.}, \times 5\frac{1}{2} + 1 \text{ yd.} = 1772 \text{ yds.}, \times 3 +$   
 $1 \text{ ft.} = 5317 \text{ ft.}, \times 12 + 6 \text{ in.} = 63,810 \text{ in.}$   
 $63,810 \text{ in.} \div 36 = 1772.5 \text{ yds.}$
- 36**  $3 \text{ mi.} \times 320 + 80 \text{ rds.} = 1040 \text{ rds.}, \times 16\frac{1}{2} = 17,160 \text{ ft.}$   
 $17,160 \text{ ft.} \div 5280 = 3.25 \text{ mi.}$
- 37**  $2 \text{ mi.} \times 320 + 2 \text{ rds.} = 642 \text{ rds.}, \times 16\frac{1}{2} + 8 \text{ ft.} = 10,596 \text{ ft.}$   
 $10,596 \text{ ft.} \div 5280 = 2.0068 + \text{ mi.}$
- 38**  $3 \text{ rds.} \times 5\frac{1}{2} + 2 \text{ yds.} = 18\frac{1}{2} \text{ yds.}, \times 3 + 2 \text{ ft.} = 57\frac{1}{2} \text{ ft.}, \times 12 + 3 \text{ in.} =$   
 $693 \text{ in.}$   $693 \text{ in.} \div 198 = 3.5 \text{ rds.}$

- 39  $4 \text{ mi.} \times 320 + 240 \text{ rds.} = 1520 \text{ rds.}, \times 5\frac{1}{2} = 8360 \text{ yds.}$   
 $8360 \text{ yds.} \div 1760 = 4.75 \text{ mi.}$
- 40  $3 \text{ mi.} \times 320 + 8 \text{ rds.} = 968 \text{ rds.}, \times 5\frac{1}{2} + 3 \text{ yds.} = 5327 \text{ yds.}, \times 3 + 2\frac{1}{2} \text{ ft.} = 15983\frac{1}{2} \text{ ft.}$   $15983\frac{1}{2} \text{ ft.} \div 3 = 5327.75 \text{ yds.}$
- 41  $7 \text{ rds.} \times 5\frac{1}{2} + 2 \text{ yds.} = 40\frac{1}{2} \text{ yds.}, \times 3 + 2 \text{ ft.} = 123\frac{1}{2} \text{ ft.}, \times 12 + 3 \text{ in.} = 1485 \text{ in.}$
- 43  $4\frac{3}{4} \text{ rds.} \div 320 = \frac{19}{128} \text{ mi.}$
- 44  $\frac{5}{8} \text{ mi.} = .83\frac{1}{8} \text{ mi.}$
- 45  $.375 \text{ mi.} \times 320 = 120 \text{ rds.}$
- 46  $2 \text{ ft.} \times 12 + 6\frac{1}{2} \text{ in.} = 30\frac{1}{2} \text{ in.}, \div 198 = .1553 + \text{ rds}$
- 47  $65 \text{ rds.} \times 5\frac{1}{2} + 2 \text{ yds.} = 359\frac{1}{2} \text{ yds.}, \times 3 + 2 \text{ ft.} = 1080\frac{1}{2} \text{ ft.}, \times 12 + 6 \text{ in.} = 12,972 \text{ in.}, \div 63,360 = .2047 + \text{ mi.}$
- 48  $25 \text{ rds.} \times 5\frac{1}{2} + 4\frac{1}{2} \text{ yds.} = 142 \text{ yds.}, \times 3 = 426 \text{ ft.}$   $35 \text{ rds.} \times 5\frac{1}{2} + 3 \text{ yds.} = 195\frac{1}{2} \text{ yds.}, \times 3 + 2\frac{1}{2} \text{ ft.} = 589\frac{1}{2} \text{ ft.}$   $426 \div 589\frac{1}{2} = .723.$
- 49  $42 \text{ rds.} \times 5\frac{1}{2} + 2 \text{ yds.} = 233 \text{ yds.}, \times 36 + 4.3 \text{ in.} = 8342.3 \text{ in.}, \div 63,360 = .1324 + \text{ mi.}$
- 50  $6 \text{ ft.} \times 12 + 8.5 \text{ in.} = 80.5., \div 198 = .4065 + \text{ rds.}$
- 51  $3\frac{1}{2} \text{ yds.} \times 36 = 126 \text{ in.}$   $7 \text{ yds.} \times 36 + 4 \text{ in.} = 256 \text{ in.}$   
 $126 \text{ in.} \div 256 \text{ in.} = \frac{63}{128}.$
- 52  $165 \text{ rds.} \times 5\frac{1}{2} + 2 \text{ yds.} = 909\frac{1}{2} \text{ yds.}, \times 3 + 2 \text{ ft.} = 2730\frac{1}{2} \text{ ft.}, \times 12 + 9 \text{ in.} = 32,775 \text{ in.}, \div 63,360 = 41\frac{1}{2} \frac{1}{4} \text{ mi.}$
- 53  $2 \text{ yds.} \times 3 + 2 \text{ ft.} = 8 \text{ ft.}, \times 12 + 2 \text{ in.} = 98 \text{ in.}$   $3 \text{ yds.} \times 36 = 108 \text{ in.}$   $98 \div 108 = \frac{49}{54}$



$$54 \quad 98 \text{ rds.} \times 5\frac{1}{2} + 7 \text{ yds.} = 546 \text{ yds.}, \times 3 + 2 \text{ ft.} = 1640 \text{ ft.}, \times 12 + 4 \text{ in.} \\ = 19,684 \text{ in.}, \div 63,360 = 1\frac{221}{11340} \text{ mi.}$$

## 177 Page 128

- 9  $39.37 \text{ in.} \times 5.24 = 206.2988 \text{ in.}, \div 12 = 17 \text{ ft. } 2.2988 \text{ in.}; \text{ or } 5 \text{ yds. } 2 \text{ ft. } 2.2988 \text{ in.}$
- 10  $39.37 \text{ in.} \times 35.428 = 1394.80036 \text{ in.}, \div 12 = 116 \text{ ft. } 2.80036 \text{ in.}$   
 $116 \text{ ft.} \div 3 = 38 \text{ yds. } 2 \text{ ft. } \text{Ans.} = 33 \text{ yds. } 2 \text{ ft. } 2.80036 \text{ in.}$
- 11  $39.37 \text{ in.} \times 5785 = 227,755.45 \text{ in.}, \div 63,360 = 3.594 + \text{ mi.}$
- 12  $7,856,918 \text{ in.} \div 39.37 = 199,566.11 + \text{ meters.}$

## SURFACE MEASURE

## 178 Page 129

- 18  $1 \text{ sq. rd.} \times 30\frac{1}{2} \times 9 = 272\frac{1}{2} \text{ sq. ft.}, \times 144 = 39,204 \text{ sq. in.}$   
 $1 \text{ A.} \times 160 \times 30\frac{1}{2} = 4840 \text{ sq. yds.}, \times 9 = 43,560 \text{ sq. ft.}$
- 19  $2 \text{ A.} \times 160 + 40 \text{ sq. rds.} = 360 \text{ sq. rds.}, \times 30\frac{1}{2} = 10,890 \text{ sq. yds.},$   
 $\times 9 + 17 \text{ sq. ft.} = 98,027 \text{ sq. ft.}$
- 20  $3 \text{ A.} \times 43,560 = 130,680 \text{ sq. ft.}$
- 21  $3 \text{ sq. mi.} \times 640 = 1920 \text{ A.}, \times 160 + 17 \text{ sq. rds.} = 307217 \text{ sq. rds.},$   
 $\times 30\frac{1}{2} + 4 \text{ sq. yds.} = 9,293,318\frac{1}{2} \text{ sq. yds.}$
- 22  $3476 \text{ sq. in.} \div 144 = 24\frac{1}{6} \text{ sq. ft.}$
- 23  $98756 \text{ sq. in.} \div 144 = 685 \text{ sq. ft. } 116 \text{ sq. in.}$
- 24  $7856 \text{ sq. ft.} \div 9 = 872 \text{ sq. yds. } 8 \text{ sq. ft. } 872 \text{ sq. yds.} \div 30\frac{1}{2} =$   
 $28 \text{ sq. rds. } 25 \text{ sq. yds. } \text{Ans.} = 28 \text{ sq. rds.}, 25 \text{ sq. yds. } 8 \text{ sq. ft.}$

- 25  $48413 \text{ sq. yds.} \div 30\frac{1}{2} = 1600 \text{ sq. rds.}, 13 \text{ sq. yds. } 1600 \text{ sq. rds.} \div 160 = 10 \text{ A. Ans.} = 10 \text{ A. } 13 \text{ sq. yds.}$
- 26  $189.5 \text{ rds.} \times 150 \text{ rds.} = 28425 \text{ sq. rds.} = 177\frac{3}{4} \text{ A.}$   
 $177\frac{3}{4} \text{ A.} \times \$75\frac{1}{2} = \$13,457.46 +.$
- 27  $37 \text{ A.} \times 160 + 128 \text{ sq. rds.} = 6048 \text{ sq. rds. } 170 \text{ A.} \times 160 + 16 \text{ sq. rds.} = 27,216 \text{ sq. rds. } 27,216 \text{ sq. rds.} - 6048 \text{ sq. rds.} = 21,168 \text{ sq. rds. } 21,168 \div 27,216 = \frac{7}{9}.$

## 179 Page 130

- 10  $1 \text{ sq. mi.} \times 640 \times 10 = 6400 \text{ sq. ch.}, \times 16 = 102,400 \text{ sq. rds.}, \times 625 = 64,000,000 \text{ sq. l.}$
- 11  $160 \text{ A.} = \frac{1}{4} \text{ sq. mi. } 64,000,000 \text{ sq. l.} \div 4 = 16,000,000.$
- 12  $2 \text{ sq. mi.} \times 640 + 6 \text{ A.} = 1286 \text{ A.}, \times 10 + 9 \text{ sq. ch.} = 12,869 \text{ sq. ch.}$
- 13  $1 \text{ A.} \times 10 \times 16 \times 625 = 100,000 \text{ sq. l.}$
- 14  $1 \text{ sq. mi.} \times 640 + 1 \text{ A.} = 641 \text{ A.}, \times 10 + 1 \text{ sq. ch.} = 6411 \text{ sq. ch.}, \times 16 + 1 \text{ sq. rd.} = 102,577 \text{ sq. rd. } 10,2577 \text{ sq. rd.} \times 625 = 64,110,625 \text{ sq. l.}$
- 15  $842,590 \text{ sq. l.} \div 625 = 1348 \text{ sq. rd. } 90 \text{ sq. l. } 1348 \text{ sq. rd.} \div 16 = 84 \text{ sq. ch. } 4 \text{ sq. rd. } 84 \text{ sq. ch.} \div 10 = 8 \text{ A.}, 4 \text{ sq. ch.}$   
 Ans.  $8 \text{ A. } 4 \text{ sq. ch. } 4 \text{ sq. rd. } 90 \text{ sq. l.}$
- 16  $25,373,896 \text{ sq. l.} \div 625 = 40,598 \text{ sq. rd. } 146 \text{ sq. l. } 40,598 \text{ sq. rd.} \div 16 = 2537 \text{ sq. ch. } 6 \text{ sq. rd. } 2537 \text{ sq. ch.} \div 10 = 253 \text{ A. } 7 \text{ sq. ch.}$   
 Ans.  $253 \text{ A. } 7 \text{ sq. ch. } 6 \text{ sq. rd. } 146 \text{ sq. l.}$
- 17  $98,754 \text{ sq. rd.} \div 16 = 6172 \text{ sq. ch. } 2 \text{ sq. rd. } 6172 \text{ sq. ch.} \div 10 = 617 \text{ A. } 2 \text{ sq. ch.}$   
 Ans.  $617 \text{ A. } 2 \text{ sq. ch. } 2 \text{ sq. rd.}$

- 18  $9857 \text{ sq. ch.} \div 10 = 985 \text{ A. } 7 \text{ sq. ch.}$   $985 \text{ A.} \div 640 = 1 \text{ sq. mi.}$   
 $345 \text{ A.}$  Ans.  $1 \text{ sq. mi. } 345 \text{ A. } 7 \text{ sq. ch.}$
- 19  $75,328 \text{ sq. rds.} \div 16 = 4708 \text{ sq. ch.,} \div 10 = 470 \text{ A. } 8 \text{ sq. ch.}$
- 20  $46 \text{ ch.} \times 37 \text{ ch.} = 1702 \text{ sq. ch.}$   $42 \text{ A. } 5\frac{1}{2} \text{ sq. ch.} = 425\frac{1}{2} \text{ sq. ch.}$   
 $1702 - 425\frac{1}{2} = 1277\frac{1}{2} \text{ sq. ch.}$   $1277\frac{1}{2} \div 1702 = \frac{1}{2}$
- 21  $5 \text{ ch.} \times 100 = 500 \text{ l.,} \times 25 = 12,500 \text{ sq. l.,} \div 100,000 = \frac{1}{8} \text{ A. lost.}$   
 $12 \text{ A.} - \frac{1}{8} \text{ A.} = 11\frac{7}{8} \text{ A.}$   $11\frac{7}{8} \div 12 = \frac{3}{8}$  cultivated.
- 22  $S. 5 \text{ ch.} + S. 3 \text{ ch.} = S. 8 \text{ ch.}$   $\therefore$  Must measure north the same distance.  $1^{\text{st}} \text{ rectangle} = 10.6 \text{ ch.} \times 5 \text{ ch.} = 53 \text{ sq. ch.}$   $2^{\text{nd}} \text{ rectangle} = 5.3 \text{ ch.} \times 3 \text{ ch.} = 15.9 \text{ sq. ch.}$   
 $53 \text{ sq. ch.} + 15.9 \text{ sq. ch.} = 68.9 \text{ sq. ch.,} \div 10 = 6.89 \text{ A.}$

180 page 132

- 3  $234.56 \text{ m.} \times 184.25 \text{ m.,} = 43,217.68 \text{ sq. m.,} \div 100 = 432.1768 \text{ ares}$
- 4  $6 \text{ m. sq.} = 36 \text{ sq. m.}$   $36 \text{ sq. m.} - 6 \text{ sq. m.} = 30 \text{ sq. m.}$
- 5  $160 \text{ A.} \div 2.47 = 64.777327 \text{ ha.,} \times 100 = 6477.7327 \text{ ares.}$

## CARPETING AND PLASTERING

181 page 132

- 1  $15\frac{1}{2} \text{ ft.} \div \frac{1}{4} \text{ yd.} = 7 \text{ breadths.}$   $17 \text{ ft.} \div 3 = 5\frac{2}{3} \text{ yds.}$   $5\frac{2}{3} \text{ yds.} \times 7 = 39\frac{2}{3} \text{ yds.}$
- 2  $33\frac{1}{2} \text{ ft.} \div 3 = 7\frac{1}{2} \text{ yds., or } 8 \text{ br'dths.}$   $17\frac{1}{2} \text{ ft.} \div 3 = 5\frac{2}{3} \text{ yds.}$   $8 \times 5\frac{2}{3} \text{ yds.} = 46\frac{2}{3} \text{ yds. crosswise.}$   $17\frac{1}{2} \text{ ft.} \div 3 = 5\frac{2}{3} \text{ yds., or } 6 \text{ breadths.,}$   
 $\times 7\frac{1}{2} \text{ yds.} = 46\frac{2}{3} \text{ yds. lengthwise.}$
- 3  $11 \text{ ft.} = 3\frac{1}{3} \text{ yds.; } 15 \text{ ft.} = 5 \text{ yds.}$   $5 \div \frac{1}{3} = 6\frac{2}{3}, \text{ or } 7 \text{ breadths,} \times 3\frac{1}{3} = 25\frac{1}{3} \text{ yds. crosswise.}$   $3\frac{1}{3} \div \frac{1}{3} = 5 \text{ breadths,} \times 5 = 25 \text{ yds. lengthwise.}$

$$4 \quad 24 \text{ ft.} \div 3 = 8 \text{ breadths. } \frac{1}{4} \text{ of } 8 = 1 \text{ yd. for matching. } 19 \text{ ft.} \div 3 = 6\frac{1}{3} \text{ yds., } \times 8 + 1 \text{ yd.} = 51\frac{2}{3} \text{ yds., } \times \$1.25 = \$64.58\frac{1}{3}.$$

$$5 \quad 13\frac{1}{2} \text{ ft.} \div \frac{1}{4} \text{ yds.} = 6 \text{ breadths. } \frac{1}{4} \times 6 = 1\frac{1}{2} \text{ yds. for matching. } 18 \text{ ft.} \div 3 = 6 \text{ yds. } 6 \text{ yds.} \times 6 + 1\frac{1}{2} \text{ yds.} = 37\frac{1}{2} \text{ yds., } \times \$2.75 = \$103.12\frac{1}{2}.$$

$$6 \quad \begin{array}{rcl} (18 \text{ ft.} + 20 \text{ ft.}) \times 10 \text{ ft.} \times 2 & = & 760 \text{ sq. ft., sides.} \\ 18 \text{ ft.} \times 20 \text{ ft.} & = & 360 \text{ sq. ft., ceiling.} \\ \hline & & 1120 \text{ sq. ft., sides and ceiling.} \end{array}$$

$$6 \text{ ft.} \times 2 \text{ ft.} \times 2 = 18 \text{ sq. ft., windows.}$$

$$7 \text{ ft.} \times 3 \text{ ft.} = 21 \text{ sq. ft., door.}$$

$$\frac{57 \text{ sq. ft.}}{2} = 28.5 \text{ sq. ft., allowance.}$$

$$1120 \text{ sq. ft.} - 28.5 \text{ sq. ft.} = 1091.5 \text{ sq. ft.} \div 9 = 121.277 \text{ sq. yds.,} \\ \times \$2.75 = \$32.74\frac{1}{2}.$$

$$7 \quad \begin{array}{rcl} (11 \text{ ft.} + 12 \text{ ft.}) \times 12 \text{ ft.} \times 2 & = & 552 \text{ sq. ft., sides.} \\ 11 \text{ ft.} \times 12 \text{ ft.} & = & 132 \text{ sq. ft., ceiling.} \\ \hline & & 684 \text{ sq. ft., sides and ceiling.} \end{array}$$

$$6 \text{ ft.} \times 2\frac{1}{2} \text{ ft.} = 15 \text{ sq. ft., window.}$$

$$7 \text{ ft.} \times 2\frac{1}{2} \text{ ft.} = 18\frac{1}{2} \text{ sq. ft., door.}$$

$$\frac{33\frac{1}{2} \text{ sq. ft.}}{2} = 16\frac{3}{4} \text{ sq. ft.}$$

$$684 \text{ sq. ft. (s. and c.)} - 16\frac{3}{4} \text{ sq. ft. (allowance)} = 667\frac{1}{4} \text{ sq. ft.}$$

$$667\frac{1}{4} \text{ sq. ft.} \times 17 = 11,341\frac{1}{4} \text{ sq. ft.} \div 9 = 1260\frac{1}{4} \text{ sq. yds.}$$

$$8 \quad \begin{array}{rcl} (90 \text{ ft.} + 65 \text{ ft.}) \times 24 \text{ ft.} \times 2 & = & 7440 \text{ sq. ft., sides.} \\ 90 \text{ ft.} \times 65 \text{ ft.} & = & 5850 \text{ sq. ft., ceiling.} \\ \hline & & 11,290 \text{ sq. ft.} \end{array}$$

$$10 \text{ ft.} \times 3 \text{ ft.} \times 13 = 390 \text{ sq. ft., windows.}$$

$$9 \text{ ft.} \times 4 \text{ ft.} \times 4 = 144 \text{ sq. ft., doors.}$$

$$\frac{534 \text{ sq. ft.}}{2} = 267 \text{ sq. ft.}$$

$$11,290 \text{ sq. ft.} - 267 \text{ sq. ft.} = 11,023 \text{ sq. ft., } \div 9 = 1224\frac{1}{3} \text{ sq. yds.}$$

- 9  $(16 \text{ ft.} + 24 \text{ ft.}) \times 9 \text{ ft.} \times 2 = 593 \text{ sq. ft., sides.}$   
 $16 \text{ ft.} \times 24 \text{ ft.} = \underline{384 \text{ sq. ft., ceiling.}}$   
 $1104 \text{ sq. ft.,} \div 9 - 12 = 110\frac{2}{3} \text{ sq. yds.}$
- 10  $(24\frac{1}{2} \text{ ft.} + 15\frac{1}{2} \text{ ft.}) \times 10 \text{ ft.} \times 2 = 795 \text{ sq. ft., sides.}$   
 $24\frac{1}{2} \text{ ft.} \times 15\frac{1}{2} \text{ ft.} = \underline{373\frac{5}{8} \text{ sq. ft., ceiling}}$   
 $1168\frac{5}{8} \text{ sq. ft.} \div 9 - 14 \text{ sq. yds.} =$   
 $115\frac{5}{8} \text{ sq. yds.,} \times \$.30 = \$34.75$
- 11  $(18 \text{ ft.} + 15 \text{ ft.}) \times 10 \text{ ft.} \times 2 = 660 \text{ sq. ft.,} \div 9 = 73\frac{1}{3} \text{ sq. yds.} - 20$   
 $\text{sq. yds.} = 53\frac{1}{3} \text{ sq. yds.} \quad 53\frac{1}{3} \div (8 \times \frac{2}{3}) = 10 \text{ rolls,} \div \$.95 = \$9.50$
- 12  $(17\frac{1}{2} \text{ ft.} + 24\frac{2}{3} \text{ ft.}) \times 10 \text{ ft.} \times 2 = 843\frac{1}{3} \text{ sq. ft., sides.}$   
 $17\frac{1}{2} \text{ ft.} \times 24\frac{2}{3} \text{ ft.} = \underline{431\frac{2}{3} \text{ sq. ft., ceiling.}}$   
 $1275 \text{ sq. ft.} \div 9 - 50 \text{ sq. yds.} = 91\frac{2}{3}$   
 $\text{sq. yds.} \times \$.33 = \$30.25$
- 13  $843\frac{1}{3} \text{ sq. ft., sides} \div 9 = 93\frac{2}{3} \text{ sq. yds.} - 50 \text{ sq. yds.} = 43\frac{2}{3} \text{ sq. yds.}$   
 $8 \times \frac{1}{4} = 4 \text{ sq. yds. in a roll.} \quad 43\frac{2}{3} \div 4 = 10\frac{2}{3} \text{ rolls,} \times$   
 $\$.75 = \$8.19.$
- 14  $30 \text{ ft.} \times 25 \text{ ft.} \times 2 = 1500 \text{ sq. ft.,} \times 144 = 216,000 \text{ sq. in.}$   
 $216,000 \text{ sq. in.} \div (5 \text{ in.} \times 4 \text{ in.}) = 108,000 \text{ sh'gles} \div 1000 = 10.8 \text{ M.}$
- 15  $100\frac{1}{2} \text{ ft.} \times 4 \text{ ft.} \div (8 \text{ in.} \times 4 \text{ in.} \div 144) = 1806 \text{ bricks.}$
- 16  $16 \text{ in.} \times 24 \text{ in.} \times 840 \div 144 = 2240 \text{ sq. ft.}$
- 17  $(18 \text{ ft.} + 16 \text{ ft.}) \times 12 \text{ ft.} \times 2 = 816 \text{ sq. ft., sides.}$   
 $18 \text{ ft.} \times 16 \text{ ft.} = \underline{288 \text{ sq. ft., ceiling.}}$   
 $1104 \text{ sq. ft., sides and ceiling}$   
 $8 \text{ ft.} \times 2\frac{2}{3} \text{ ft.} \times 2 \div 2 = 32 \text{ sq. ft., windows.}$   
 $8 \text{ ft.} \times 3 \text{ ft.} \times 2 \div 2 = 24 \text{ sq. ft., doors.}$   
 $\underline{56 \text{ sq. ft. allowance}}$   
 $1104 \text{ sq. ft.} - 56 \text{ sq. ft.} = 1048 \text{ sq. ft.,} \div 9 = 116\frac{4}{9} \text{ sq. yds.,} \times$   
 $\$.37\frac{1}{2} = \$43.66\frac{2}{3}.$

- 18**  $3 \text{ ft.} \times \frac{8}{12} \text{ ft.} \times 2 = 4 \text{ sq. ft. both sides; } 4 \text{ ft.} \times \frac{8}{12} \text{ ft.} = 2\frac{2}{3} \text{ sq. ft. top.}$   
 $4 \text{ sq. ft.} + 2\frac{2}{3} \text{ sq. ft.} = 6\frac{2}{3} \text{ sq. ft.} \times 144 \div (4 \times 4) = 60 \text{ tiles.}$
- 

## SOLID MEASURE

183 Page 135

- 1**  $17\frac{1}{2} \times 14 \times 12 = 2940 \text{ cu. ft., } \div 27 = 108\frac{2}{3} \text{ cu. yds.}$
- 2**  $18 \times 12 \times 9\frac{1}{4} = 1889 \text{ cu. ft., } \div 128 = 15\frac{3}{8} \text{ cords.}$
- 12**  $9 \times 4 \div 144 \times 24 = 6 \text{ cu. ft.}$
- 16**  $13 \text{ c. yds.} \times 27 + 11 \text{ cu. ft.} = 332 \text{ cu. ft., } \times 1728 = 625,536 \text{ cu. in.}$
- 17**  $9 \text{ cu. yds.} \times 27 + 4 \text{ cu. ft.} = 247 \text{ cu. ft., } \times 1728 + 13 \text{ cu. in.} = 426,829 \text{ cu. in.}$
- 18**  $159,728 \text{ cu. in.} \div 1728 = 92 \text{ cu. ft. } 752 \text{ cu. in. } 92 \text{ cu. ft.} \div 27 = 3 \text{ cu. yds. } 11 \text{ cu. ft. Ans. } 3 \text{ cu. yds. } 11 \text{ cu. ft. } 11 \text{ cu. ft. } 752 \text{ cu. in.}$
- 19**  $9 \text{ cu. ft.} \times 1728 + 828 \text{ cu. in.} = 1638 \text{ cu. in. } 7 \text{ cu. ft.} \times 1728 + 932 \text{ cu. in.} = 13,028 \text{ cu. in. } 16,380 \text{ cu. in.} + 13,028 \text{ cu. in.} = 29,408 \text{ cu. in.}$
- 20**  $12 \times 11 \times 9 = 1188 \text{ cu. ft., } \div 27 = 44 \text{ cu. yds.}$
- 21**  $30 \text{ in.} \times 24 \text{ in.} \times 2 \text{ in.} = 1440 \text{ cu. in.}$
- 22**  $27 \times 175 \text{ lbs.} = 4725 \text{ lbs.}$
- 23**  $7 \text{ ft.} \times 9 \text{ ft.} \times 7 \text{ ft.} = 441 \text{ cu. ft., } \times 1728 = 762,048 \text{ cu. in.}$
- 24**  $128 \text{ cu. ft.} \times 1\frac{1}{2} = 192 \text{ cu. ft., } \div (3\frac{1}{2} \text{ ft.} \times 5 \text{ ft.}) = 10\frac{2}{5} \text{ ft.}$
- 25**  $7 \text{ ft.} \times 7 \text{ ft.} \times 7 \text{ ft.} = 343 \text{ cu. ft., } \div 27 = 12 \text{ cu. yds. } 19 \text{ cu. ft.}$

- 26 ft.  $\times 4\frac{1}{2}$  ft.  $\times 6$  ft. = 1512 cu. ft.,  $\div 128$  cu. ft. =  $11\frac{1}{8}$  cords.
- 27 16 ft.  $\times 4\frac{1}{2}$  ft.  $\times 7\frac{1}{2}$  ft. = 520 cu. ft.,  $\div 128$  cu. ft. =  $4\frac{1}{8}$  cords.,  $\times$   
\$6.50 = \$26.41.
- 28 247 cu. ft.  $\div 27$  =  $9\frac{1}{3}$  cu. yds.
- 29 63 ft.  $\times 157$  ft.  $\times 8$  ft. = 79,128 cu. ft.,  $\div 27$  = 2930 $\frac{2}{3}$  cu. yds.
- 30 (150 ft.  $\times 60$  ft.  $\div 2$ )  $\times 9$  ft. = 40,500 cu. ft.,  $\div 128$  cu. ft. =  $316\frac{1}{8}$   
cords,  $\times$  \$9.60 = \$3005.86.
- 31 20 cu. ft.  $\times 1728 + 432$  cu. in. = 34,992 cu. in.,  $\div 46,656$  cu. in.  
= 75 cu. yds.
- 32 216 cu. in.  $\div 1728$  = .125 cu. ft.
- 33 648 cu. in.  $\div 46,656$  =  $\frac{1}{72}$  cu. yd.
- 34 .75 cu. yd.  $\times 46,656$  = 34,992 cu. in.
- 35 .975 cu. yd.  $\times 46,656$  = 45,489.6 cu. in.,  $\div 1728$  = 26 cu. ft.  
561.6 cu. in.
- 36 .375 cds.  $\times 128$  = 48 cu. ft.

- 3 28.5 steres.  $\times .276$  = 7.866 cds.
- 4 7.2 m.  $\times 1.7$  m.  $\times 2$  m. = 24.48 cu. m. or steres. 24.48 steres  
 $\times .276$  = 6.75648 cds.

## STONE AND LUMBER

185 Page 188

- 1  $(22 \text{ ft.} + 45 \text{ ft.}) \times 8 \text{ ft.} \times 1\frac{1}{2} \text{ ft.} \times 2 = 1608 \text{ cu. ft.} \div 16\frac{1}{2} = 97\frac{1}{11}$   
perch,  $\times \$5.25 = \$511.64$ .
- 2  $(30 \text{ ft.} + 45 \text{ ft.}) \times 20 \text{ ft.} \times 1 \text{ ft.} \times 2 = 3000 \text{ cu. ft.}$   $7 \text{ ft.} \times 2\frac{1}{2} \text{ ft.} \times 1 \text{ ft.} \times 10 = 175 \text{ cu. ft.}$ ;  $3 \text{ ft.} \times 8 \text{ ft.} \times 1 \text{ ft.} \times 4 = 96 \text{ cu. ft.}$ ;  $175 \text{ cu. ft.} + 96 \text{ cu. ft.} = 271 \text{ cu. ft.}$   $3000 \text{ cu. ft.} - 271 \text{ cu. ft.} = 2729 \text{ cu. ft.}$ ,  $\times 21 = 57,309 \text{ bricks}$ .
- 3  $(58 \text{ ft.} \times 25 \text{ ft.}) \times 44 \text{ ft.} = 7304 \text{ sq. ft.}$   $8 \text{ ft.} \times 3 \text{ ft.} \times 29 = 696 \text{ sq. ft.}$   $7304 \text{ sq. ft.} - 696 \text{ sq. ft.} = 6608 \text{ sq. ft.}$ ,  $\times 1\frac{1}{2} \text{ ft.} = 9912 \text{ cu. ft.}$   
 $\times 21 = 208,152 \text{ bricks} \div 1000 = 208.157 \text{ M.}$ ,  $\times \$4 = \$832.61$ .
- 4  $(9 \text{ rds.} + 7 \text{ rds.}) \times 2 \times 16\frac{1}{2} \times 5 \text{ ft.} \times 1\frac{1}{2} \text{ ft.} = 3960 \text{ cu. ft.} =$   
 $3960 \text{ cu. ft.} \div 16\frac{1}{2} = 240 \text{ perches}$ .
- 5  $40 \text{ rds} \times 4 = 160 \text{ rds.} \times 16\frac{1}{2} \times 4 \text{ ft.} \times 2 \text{ ft.} \div 16\frac{1}{2} = 1280 \text{ perches}$ .
- 6  $(46 \text{ ft.} + 34 \text{ ft.}) \times 2 = 160 \text{ ft.} \times 20 \text{ ft.} = 3200 \text{ sq. ft.}$   $8 \text{ ft.} \times 3 \text{ ft.} \times 12 = 288 \text{ sq. ft.}$ ;  $7\frac{1}{2} \text{ ft.} \times 3\frac{1}{2} \text{ ft.} \times 6 = 149\frac{1}{2} \text{ sq. ft.}$ ;  $288 \text{ sq. ft.} + 149\frac{1}{2} \text{ sq. ft.} = 437\frac{1}{2} \text{ sq. ft.}$   $3200 \text{ sq. ft.} - 437\frac{1}{2} \text{ sq. ft.} = 2762\frac{1}{2} \text{ sq. ft. (surface)} \times 1\frac{1}{2} \text{ ft.} = 4143\frac{3}{4} \text{ cu. ft.} \times 21 = 87,018\frac{3}{4} \text{ bricks}$ .
- 7  $14 \times 1\frac{1}{2} = 18\frac{1}{2} \text{ ft.}$ ,  $\times \$0.07\frac{1}{2} = \$1.40$ .
- 8  $\frac{1}{2} \text{ of } 16 + 11 = 13\frac{1}{2}$ , average width.  $13\frac{1}{2} \times 15 \div 12 = 16\frac{1}{4} \text{ ft.}$
- 9  $30\frac{1}{4} \times 8 \times 8 \div 12 = 162\frac{3}{4} \text{ ft.}$
- 10  $40 \times 14 \times 11 \div 1000 = .513\frac{1}{2} \text{ M.} \times \$32.50 = \$16.684$ .
- 11  $9\frac{1}{2} \times 12 \times 14 \times 3 \div 12 = 378 \text{ ft.} \div 1000 = .378 \text{ M.}$ ,  $\times \$40 = \$15.12$



$$12 \quad 45 \times 18 \times 2 \times 4 \div 12 = 540 \text{ ft.}$$

$$13 \quad 328 \times 12 \times 8 \div 12 = 2624 \text{ ft.}, \div 1000 = 2.624 \text{ M.}, \times \$24 = \$62.98 -$$

$$14 \quad 12 \times 8 \times 1 \div 12 = 8 \text{ ft.}$$

$$15 \quad 24 \times 10 \times 1 = 240 \text{ ft.}$$

$$16 \quad 8 \times 14 \times 10 \times 3 \div 12 = 280 \text{ ft.}$$

$$17 \quad 50 \times 12 \times 1 = 600 \text{ ft.}$$

$$18 \quad 10 \times 18 \times 4 \times 6 \div 12 = 360 \text{ ft.}$$

$$19 \quad 8 \times 18 \times 16 \times 2 \div 12 = 384 \text{ ft.}$$

$$20 \quad 11 \times (18 + 11) \div 2 \times 1 = 13\frac{7}{4} \text{ ft.}$$

$$21 \quad 2 \times 19 \times 15 \times 15 \div 12 = 712\frac{1}{2} \text{ ft.}$$

## LIQUID MEASURE

186 page 140

$$13 \quad 1 \text{ bbl.} \times 31\frac{1}{2} \times 4 + 2 \text{ qts.} = 128 \text{ qts.}, \times 2 + 1 \text{ pt.} = 257 \text{ pts.}$$

$$14 \quad 5 \text{ bbls.} \times 31\frac{1}{2} \times 4 + 6 \text{ qts.} = 636 \text{ qts.}$$

$$15 \quad 1 \text{ bbl.} \times 31\frac{1}{2} \times 4 = 126 \text{ qts.}, \times 2 = 252 \text{ pts.}$$

$$16 \quad 5 \text{ bbls.} \times 31\frac{1}{2} \times 4 + 2 \text{ qts.} = 632 \text{ qts.}, \times 2 + 1 \text{ pt.} = 1265 \text{ pts.}$$

$$17 \quad 2 \text{ gals.} \times 4 + 1 \text{ qt.} = 9 \text{ qts.}, \times 2 + 1 \text{ pt.} = 19 \text{ pts.}$$

$$18 \quad \frac{1}{2} \text{ bbl.} \times 31\frac{1}{2} \times 4 + 3 \text{ qts.} = 66 \text{ qts.}$$

$$19 \quad 1 \text{ bbl.} \times 31\frac{1}{2} \times \frac{1}{4} \text{ gal.} = 31\frac{1}{2} \text{ gals.}, \times 4 + 1 \text{ qt.} = 127 \text{ qts.}, \times 2 = 1 \text{ pt.} = 255 \text{ pts.}$$

$$20 \quad 7856 \text{ qts} \div 4 = 1964 \text{ gals.}, \div 31\frac{1}{2} = 62 \text{ bbls. } 11 \text{ gals}$$

$$21 \quad 9563 \text{ pts.} \div 2 = 4781 \text{ qts. } 1 \text{ pt.} \quad 4781 \text{ qts.} \div 4 = 1195 \text{ gals.} \\ 1 \text{ qt.} \quad 1195 \text{ gals.} \div 31\frac{1}{2} = 37 \text{ bbls. } 39 \text{ gals.} \quad \text{Ans. } 37 \text{ bbls.} \\ 39 \text{ gals. } 3 \text{ qts. } 1 \text{ pt.}$$

$$22 \quad 9543 \text{ qts.} \div 4 = 2385 \text{ gals. } 3 \text{ qts.} \quad 2385 \text{ gals.} \div 31\frac{1}{2} = 75 \text{ bbls.} \\ 22 \text{ gals. } 2 \text{ qts.} \quad 75 \text{ bbls. } 22 \text{ gals. } 2 \text{ qts.} + 3 \text{ qts.} = 75 \text{ bbls.} \\ 23 \text{ gals. } 1 \text{ qt.}$$

$$23 \quad 86543 \text{ pts.} \div 2 = 43271 \text{ qts. } 1 \text{ pt.} \quad 43271 \text{ qts.} \div 4 = 10417 \text{ gals.} \\ 3 \text{ qts. } 10417 \text{ gals.} \div 31\frac{1}{2} = 343 \text{ bbls. } 12 \text{ gals. } 2 \text{ qts.}, + 3 \text{ qts. } 1 \text{ pt.} \\ = 343 \text{ bbls. } 13 \text{ gals. } 1 \text{ qt. } 1 \text{ pt.}$$

$$24 \quad 6754 \text{ gals.} \div 31\frac{1}{2} = 214 \text{ bbls. } 13 \text{ gals.}$$

$$25 \quad 16 \text{ gals.} \times 4 \times 2 = 128 \text{ pts.}$$

$$26 \quad 2 \text{ bbls.} \times 31\frac{1}{2} + 4 \text{ gals.} = 67 \text{ gals.}, \times 4 + 2 \text{ qts.} = 270 \text{ qts.}, \times 2 \\ + 1 \text{ pt.} = 541 \text{ pts.}, \times \$0.05 = \$27.05$$

$$27 \quad \begin{array}{r} 41 \text{ gals.} \quad 3 \text{ qts.} \quad 1\frac{1}{2} \text{ pts.} \\ 25 \text{ " } \quad 7 \text{ " } \quad 1 \text{ " } \\ 9 \text{ " } \quad 3 \text{ " } \quad 1\frac{1}{2} \text{ " } \\ \hline 78 \text{ gals.} \quad 3 \text{ qts.} \end{array} \quad 78\frac{3}{4} \text{ gals.} \times \$0.75 = \$59.06$$

$$28 \quad \begin{array}{r} 73 \text{ gals.} \quad 3 \text{ qts.} \\ 60 \text{ " } \quad 2 \text{ " } \\ 40 \text{ " } \quad 1 \text{ " } \\ 65 \text{ " } \quad 2 \text{ " } \\ \hline 240 \text{ gals.} \end{array} \quad 240 \text{ gals.} \times \$0.17 = \$40.80$$

$$29 \quad 150,000 \text{ gals.} \div 5 = 30,000 \text{ cans.}, \times \$1.75 = \$52,500.$$

$$30 \quad 4 \text{ gals. } 1 \text{ pt.} = 33 \text{ pts.} \quad 1 \text{ bbl.} = 252 \text{ pts.} \quad 33 \div 252 = \frac{1}{8} \text{ bbls.}$$

$$31 \quad 75 \text{ bbls.} \times 252 = 189 \text{ pts.} \div 2 = 94 \text{ qts. 1 pt.} \quad 94 \text{ qts.} \div 4 = 23 \text{ gals. 2 qts.} \quad \text{Ans. 23 gals. 2 qts. 1 pt.}$$

$$32 \quad \frac{3}{4} \text{ bbls.} \times 252 = 189 \text{ pts.} \quad 13 \text{ gals. 1 pt.} = 105 \text{ pts.} \quad 105 \div 189 = \frac{5}{8} \text{ bbl.}$$

$$33 \quad \frac{1}{2} \text{ of (16 gals. 2 qts.)} = 33 \text{ qts.} \quad 1\frac{1}{2} \text{ bbls.} \times 31\frac{1}{2} \times 4 = 189 \text{ qts.} \quad 33 + 189 = 1\frac{1}{2}.$$

$$34 \quad \frac{1}{2} \text{ gal.} \div 31\frac{1}{2} = \frac{1}{63} = .0238 \text{ bbl.}$$

$$35 \quad .375 \text{ bbl.} \times 31\frac{1}{2} = 11.8125 \text{ gals.,} \times 4 = 47.25 \text{ qts}$$

## 187 Page 141

$$4 \quad 2.75 \text{ m.} \times 1.82 \text{ m.} \times 1.12 \text{ m.} = 560.56 \text{ cu. m.,} \times 10 = 5605.6 \text{ cu. dm., li., or kg.}$$

$$5 \quad 5605.6 \times 1.057 \text{ qts.} = 5925.1192 \text{ qts.,} \div 4 = 1481.2798 \text{ gals} \\ 5605.6 \times 2.2 \text{ lbs.} = 12332.32 \text{ lbs.}$$

## WEIGHTS

## 189 Page 145

$$39 \quad 5 \text{ oz.} \times 20 + 5 \text{ pwt.} = 105 \text{ pwt.} \quad 105 \div 240 = \frac{7}{16} \text{ lb}$$

$$40 \quad \frac{1}{16} \text{ of } \frac{1}{16} \text{ lb.} = \frac{1}{256} = .0225 \text{ lb.}$$

$$41 \quad .08 \text{ lb.} \times 12 = 96 \text{ oz.,} \times 20 = 19\frac{1}{2} \text{ pwt.}$$

$$43 \quad 4 \text{ oz.} \times 20 + 10 \text{ pwt.} = 90 \text{ pwt.,} \div 240 = .375 \text{ lb.}$$

$$44 \quad 2 \text{ cen.} \times 100 + 1\frac{1}{2} \text{ lb.} = 200\frac{1}{2} \text{ lbs.} \quad 200\frac{1}{2} \text{ lbs.} \div 2000 \text{ lbs.} \\ = \frac{41}{800} \text{ T.}$$

$$45 \quad 3 \text{ cen.} \times 100 + \frac{1}{2} \text{ lb.} = 300\frac{1}{2} \text{ lbs.} \quad 300\frac{1}{2} \text{ lbs.} \div 2000 \text{ lbs.} = .15025 \text{ T.}$$

- 46  $\frac{1}{15}$  T.  $\times 20 = 8\frac{1}{3}$  cwt.  $\frac{1}{3}$  cwt.  $\times 100 = 33\frac{1}{3}$  lbs.  $\frac{1}{2}$  lb.  $\times 16 = 8$  oz.  
 Ans. 8 cen., 33 lbs.,  $5\frac{1}{3}$  oz.
- 47  $.075$  T.  $\times 20 = 1.5$  cwt.  $.5$  cwt.  $\times 100 = 50$  lbs. Ans. 1 cwt. 50 lbs.
- 48  $\frac{1}{2}$  of  $2\frac{1}{2}$  T.  $= \frac{1}{2}$  T.  $\frac{7}{15} \div \frac{1}{2} = \frac{14}{15}$  T.
- 49  $.065$  T.  $= \frac{13}{200}$  T.  $\div 3 = \frac{13}{600}$  T.
- 50  $17$  cwt.  $\times 100 \div 50$  lbs.  $= 1750$  lbs.,  $\div 200 = .875$  T.

## 190 Page 145

- 3  $434.28$  grains  $\times 15.4$  grs.  $= 6687.912$  grains,  $\div 24 = 278$  pwt.  
 $15.912$  gr.  $= 278$  pwt.  $\div 20 = 13$  oz. 18 pwt.  
 Ans. 1 lb. 1 oz. 18 pwt.  $15.912$  gr.  
 $6687.912$  gr.  $\div 437.5$  gr.  $= 15$  oz. 125.412 grs. Av
- 4  $74,625,837$  grains  $\div 1000 = 74,625.837$  li.
- 5  $1$  bbl.  $\times 31\frac{1}{2} \times 4 = 126$  qts.  $\div 1.057$  qts.  $= 119.20 +$  li.
- 6  $87.5$  m.  $\times 115$  m.  $\times .015$  m.  $= 1509.375$  cu. m.,  $\times 1000 = 1,509,375$  cu. dm., or li.

## CIRCULAR MEASURE

## 191 Page 147

- 9  $29^\circ \times 60 + 35' = 1775'. \times 60 + 26'' = 106,526''$
- 10  $943,767'' \div 60 = 15,729' 25''$ .  $15,729' \div 60 = 262^\circ 9'$   
 Ans.  $262^\circ 9' 25''$
- 11  $\frac{1}{2}$  of  $45^\circ = 16\frac{1}{4}^\circ$ .  $\frac{1}{2}^\circ \times 60 = 52\frac{1}{2}'$ .  $\frac{1}{2}' \times 60 = 30''$  Ans.  $16^\circ 52' 30''$
- 12  $1$  quad  $= 90^\circ$ ,  $\times 60 \times 60 = 324,000''$ .  $25'' \div 324,000'' = \frac{1}{12960}$  quad.

13.  $\frac{1}{10} \div 3 = \frac{1}{30}$  Ans.

14.  $.32 \text{ quad.} \div 4 = .08 \text{ circum.}$

15.  $5^\circ 2' 3'' = 18,123''$ ;  $1^\circ 40' 41'' = 6041''$   $6041 \div 18,123 = \frac{1}{3}$ .

16.  $9^\circ 3' 28'' = 33,948''$ ;  $25^\circ 3' 28'' = 90,208''$ .  $33,948 \div 90,208 = .3763$

17.  $\frac{1}{2}$  of  $22^\circ 50' = 274'$ ;  $9^\circ 8' = 548'$ .  $274' \div 548' = \frac{1}{2}$ .

18.  $.125^\circ \times 60 = 7.5'$ .  $.5' \times 60 = 30''$ . Ans.  $7' 30''$

## TIME

192 Page 148

10. 1 day 2 hrs. 40 min. 20 sec.  $\div 2 = 13 \text{ hrs. } 20 \text{ min. } 10 \text{ sec.}$

11. 2 min. 35 sec.  $\times 3 = 7 \text{ min. } 45 \text{ sec.}$

12.  $6 \times 4 \text{ wks.} = 24 \text{ wks.}$   $6 \times \$3 = \$18$  weekly income,  $- \$5 = \$13$ .  
 $24 \times \$13 = \$312$ .

13.  $5 \text{ hrs.} \times 60 + 15 \text{ min.} = 315 \text{ min.}$ ,  $\times 60 + 25 \text{ sec.} = 18,925 \text{ sec.}$

14.  $2 \text{ yrs.} \times 365 + 11 \text{ days} = 741 \text{ days}$ ,  $\times 24 = 17,784 \text{ hrs.}$ ,  $\times 60 + 12 \text{ min.} = 1,067,052 \text{ min.}$

15.  $3 \text{ yrs.} \times 365 + 37 \text{ da.} = 1132 \text{ da.}$ ,  $\times 24 + 16 \text{ hrs.} = 27,184 \text{ hrs.}$ ,  $\times 60 + 24 \text{ min.} = 1,631,064 \text{ min.}$ ,  $\times 60 + 13 \text{ sec.} = 97,863,853 \text{ sec.}$

16.  $58,967,379 \text{ sec.} \div 60 = 982,789 \text{ min. } 39 \text{ sec.}$ ;  $982,789 \text{ min.} \div 60 = 16,379 \text{ hrs. } 49 \text{ min.}$ ;  $16,379 \text{ hrs.} \div 24 = 682 \text{ days } 11 \text{ hours}$   
 $682 \text{ da.} \div 365 = 1 \text{ yr. } 317 \text{ da.}$  Ans. 1 yr. 317 da. 11 hrs. 49 min. 39 sec.

- 17**  $47,675 \text{ min.} \div 60 = 794 \text{ hrs. } 35 \text{ min.}$ ;  $794 \text{ hrs.} \div 24 = 33 \text{ da. } 2 \text{ hrs.}$   
 Ans. 33 days 2 hrs. 35 min.
- 18**  $427,329 \text{ sec.} \div 60 = 7122 \text{ min. } 9 \text{ sec.}$ ;  $7122 \text{ min.} \div 60 = 118 \text{ hrs. } 42 \text{ min.}$ ;  $118 \text{ hrs.} \div 24 = 4 \text{ da. } 22 \text{ hrs.}$  Ans. 4 da. 22 hrs. 42 min. 9 sec.
- 19**  $157,540 \text{ min.} \div 60 = 2625 \text{ hrs. } 40 \text{ min.}$ ;  $2625 \text{ hrs.} \div 24 = 109 \text{ da. } 9 \text{ hrs.}$  Ans. 109 da. 9 hrs. 40 min.
- 20**  $8,567,983 \text{ sec.} \div 60 = 142,799 \text{ min. } 43 \text{ sec.}$ ;  $142,799 \text{ min.} \div 60 = 2379 \text{ hrs. } 59 \text{ min.}$ ;  $2379 \text{ hrs.} \div 24 = 99 \text{ da. } 3 \text{ hrs.}$   
 Ans. 99 da. 3 hrs. 59 min. 43 sec.
- 21** 1 da. 6 hrs. 15 min. minus 21 hrs. 25 min. = 8 hrs. 50 min.  
 $8 \text{ hrs.} \times 60 + 50 \text{ min.} = 530 \text{ min.}$
- 22** 1 da. 5 hrs. 8 min. 16 sec. minus 15 hrs. 9 min. 25 sec. = 13 hrs. 42 min. 19 sec.
- 23**  $5 \text{ yrs.} \times 365 \text{ da.} = 1825 \text{ da.}$   $1825 \times 25 \text{ min.} = 45625 \text{ min.}$ ,  $\div 60 = 760 \text{ hrs. } 25 \text{ min.}$   $760 \text{ hrs.} \div 24 = 31 \text{ da. } 16 \text{ hrs.}$  Ans. (without leap year day) = 31 da. 16 hrs. 25 min.
- 24**  $6 \text{ mo.} \times 20 \text{ da.} = 120 \text{ school da.}$ ,  $\times (25\frac{1}{2} \text{ min.} \times 2 \text{ trips}) \times 2$  (return trips) = 12,120 min.,  $\div 60 = 202 \text{ hrs.}$
- 25**  $\frac{1}{2} \text{ yr.} \times 365 = 304\frac{1}{2} \text{ da.}$   $\frac{1}{2} \text{ da.} \times 24 = 4 \text{ hrs.}$  Ans. 304 da. 4 hrs.
- 26** 1 da. = 86,400 sec.,  $2 \text{ hrs.} \times 60 + 30 \text{ min.} = 150 \text{ min.}$ ,  $\times 60 + 45 \text{ sec.} = 9045 \text{ sec.}$   $9045 \div 86,400 = \frac{47}{48} \text{ da.}$

**27**  $6 \text{ da.} \times 24 + 15 \text{ hrs.} = 159 \text{ hrs.}, \times 60 + 40 \text{ min.} = 9580 \text{ min.}, \times 60 + 36 \text{ sec.} = 574,836 \text{ sec.}; 3 \text{ da.} \times 24 + 7 \text{ hrs.} = 79 \text{ hrs.}, \times 60 + 50 \text{ min.} = 4790 \text{ min.}, \times 60 + 18 \text{ sec.} = 287,418 \text{ sec.}$   
 $287,418 \div 574,836 = \frac{1}{2}.$

**28**  $.075 \times 24 = 1.8 \text{ hrs.}$   $.8 \text{ hr.} \times 60 = 48 \text{ min.}$  Ans. 1 hr. 48 min.  
 $.625 \text{ wk.} \times 7 = 4.37\frac{1}{2} \text{ da.}$   $\frac{1}{2} \text{ da.} \times 24 = 9 \text{ hrs.}$  Ans. 4 da, 9 hrs.  
 $.378 \text{ yr.} \times 365 = 137.97 \text{ da.}$   $.97 \text{ da.} \times 24 = 23.28 \text{ hrs.}$   $.28 \text{ hr.} \times 60 = 16.8 \text{ min.}$   $.8 \text{ min.} \times 60 = 48 \text{ sec.}$  Ans. 137 da. 23 hrs. 16 min. 48 sec.

**29**  $1 \text{ wk.} = 168 \text{ hrs.}$   $2 \text{ da.} \times 24 + 18 \text{ hrs.} = 66 \text{ hrs.}$   
 $66 \div 168 = \frac{1}{2}\frac{1}{2} \text{ wk.}$

**30**  $.58 \text{ yr.} \times 365 = 211.7 \text{ da.}$   $.7 \text{ da.} \times 24 = 16.8 \text{ hrs.}$   $.8 \text{ hr.} \times 60 = 48 \text{ min.}$  Ans. 211 da. 16 hrs. 48 min.

**31**  $34 \text{ da.} \times 24 + 14 \text{ hrs.} = 830 \text{ hrs.}, \times 60 + 6 \text{ min.} = 49,806 \text{ min.}, \times 60 + 24 \text{ sec.} = 2,988,384 \text{ sec.}$   $4 \text{ da.} \times 24 + 7 \text{ hrs.} = 103 \text{ hrs.}, \times 60 + 45 \text{ min.} = 6205 \text{ min.}, \times 60 + 48 \text{ sec.} = 372,348 \text{ sec.}$   
 $372,348 \div 2,988,384 = .125$

**32**  $.975 \text{ yr.} \times 365 = 355.875 \text{ da.}$   $.875 \text{ da.} \times 24 = 21 \text{ hrs.}$   
 Ans. 355 da. 21 hrs.

**33**  $.125 \text{ yr.} \times 365 = 45.625 \text{ da.}$   $.625 \text{ da.} \times 24 = 15 \text{ hrs.}$   
 Ans. 45 da. 15 hrs.

**34**  $1 \text{ mo.} = 720 \text{ hrs.}$   $22 \text{ da.} \times 24 + 12 \text{ hrs.} = 540 \text{ hrs.}$   
 $540 \div 720 = \frac{3}{4} \text{ mo.}$

- 35 1 mo. = 2,592,000 sec. 2 hrs.  $\times 60 + 40$  min. = 160 min.,  $\times 60 + 36$  sec. = 9636 sec.  $9636 \div 2,592,000 = \frac{11}{216000}$  mo.
- 36 1 wk. = 10,080 min. 11 hrs.  $\times 60 + 33$  min. = 693 min.  $693 \div 10,080 = \frac{11}{1440}$  wk.
- 37 1 da. = 86,400 sec. 31 min.  $\times 60 + 30$  sec. = 1890 sec.  $1890 \div 86,400 = \frac{7}{480}$  da.
- 38 4.655 yr. .655 yr.  $\times 365 = 239.075$  da. .075 da.  $\times 24 = 1.8$  hr. .8 hr.  $\times 60 = 48$  min. Ans. 4 yr. 239 da. 1 hr. 48 min.
- 39 1 wk. = 168 hrs. 3 da.  $\times 24 + 3$  hrs. = 75 hrs.  $75 \div 168 = .4464$  wk.
- 40 6 mo.  $\times 30 + 9$  da. = 189 da.,  $\times 24 + 13$  hrs. = 4349 hrs.,  $\times 60 + 35$  min. = 272,965 min.,  $\times 60 = 16,377,900$  sec.; 2 mos.  $\times 30 + 3$  da. = 63 da.,  $\times 24 + 4$  hrs. = 1516 hrs.,  $\times 60 + 28$  min. = 90,988 min.,  $\times 60 + 28$  sec. = 5,459,308 sec.  $5,459,308 \div 1,637,790 = .333 +$
- 41 12 da.  $\times 24 + 1$  hr. = 289 hrs.,  $\times 60 \times 60 = 1,040,400$  sec. 3 hrs.  $\times 60 + 37$  min. = 217 min.,  $\times 60 + 1$  sec. = 13,021 sec.  $13,021 \div 1,040,400 = .0125 +$

## LONGITUDE AND TIME

193 Page 150

- 8 2 hrs. 25 min. 6 sec.,  $\times 15 = 30^\circ 16' 30''$
- 9 1 " 24 " 16 "  $\times 15 = 21^\circ 4' 0''$
- 10 3 " 14 " 28 "  $\times 15 = 48^\circ 37' 0''$



- 11** 5 hrs. 13 min. 12 sec.,  $\times 15 = 78^\circ 18' 0''$
- 12** 4 " 8 " 12 "  $\times 15 = 62^\circ 3' 0''$
- 13** 17 " 9 " 14 ,  $\times 15 = 257^\circ 18' 30''$   
 $360^\circ - (257^\circ 18' 30'') = 102^\circ 41' 30''$
- 14** 15 hrs. 14 min. 13 sec.,  $\times 15 = 228^\circ 33' 15''$   
 $360^\circ - (228^\circ 33' 15'') = 131^\circ 26' 45''$
- 15**  $122^\circ 24' 15'' - 93^\circ 56' = 29^\circ 19' 15'' \div 15 = 1 \text{ hr. } 57 \text{ min. } 17 \text{ sec.}$
- 16**  $90^\circ 5' - 74^\circ 3'' = 16^\circ 4' 57'' \div 15 = 1 \text{ hr. } 4 \text{ min. } 19\frac{1}{3} \text{ sec.}$
- 17**  $72^\circ 53' - 13^\circ 23' 53'' = 59^\circ 29' 7'' \div 15 = 3 \text{ hrs. } 57 \text{ min. } 56\frac{1}{3} \text{ sec.}$
- 18**  $122^\circ 24' 15'' - 74^\circ 3'' = 48^\circ 24' 12'' \div 15 = 3 \text{ hrs. } 13 \text{ min. } 36\frac{1}{3} \text{ sec.}$
- 19**  $87^\circ 37' 30'' + 30^\circ 18' = 117^\circ 55' 30'' \div 15 = 7 \text{ hrs. } 51 \text{ min. } 42 \text{ sec.}$
- 20**  $99^\circ 5' - 90^\circ 15' 16'' = 8^\circ 49' 44'' \div 15 = 35 \text{ min. } 18\frac{1}{3} \text{ sec.}$
- 21**  $84^\circ 26' - 77^\circ 2' 48'' = 7^\circ 23' 12'' \div 15 = 29 \text{ min. } 32\frac{1}{3} \text{ sec.}$
- 22**  $166^\circ 28' 54'' \text{ E} + 73^\circ 34' \text{ W} = 190^\circ 2' 54''$   
 $360^\circ - 190^\circ 2' 54'' = 169^\circ 57' 6'' \div 15 = 11 \text{ hrs. } 19 \text{ min. } 48\frac{1}{3} \text{ sec.}$
- 23**  $122^\circ 24' 15'' + 2^\circ 20' 22'' = 124^\circ 44' 37'' \div 15 = 8 \text{ hrs. } 18 \text{ min. } 58\frac{1}{3} \text{ sec. P. M.}$
- 24**  $71^\circ 3' 30'' \text{ W.} + 116^\circ 28' 54'' = 187^\circ 32' 24'' \div 15 = 12 \text{ hrs. } 30 \text{ min. } 9\frac{1}{3} \text{ sec.}$   
 6 P. M. + 12 hrs. 30 min.  $9\frac{1}{3} \text{ sec.} = 6 \text{ hrs. } 30 \text{ min. } 9\frac{1}{3} \text{ sec. A. M. next day.}$
- 25**  $30^\circ 18' - 2^\circ 20' 22'' = 27^\circ 57' 38'' \div 15 = 1 \text{ hr. } 51 \text{ min. } 50\frac{1}{3} \text{ sec.}$   
 A. M. next day.

- 26** 10 hrs. 30 min. - 7 hrs. 20 min. = 3 hrs. 10 min.,  $\times 15 = 47^\circ 30'$ .  
 $47^\circ 30' + 121^\circ 26' = 168^\circ 56' \text{ W.}$   
 14 hrs. 25 min. - 10 hrs. 30 min. = 3 hrs. 55 min.  $\times 15 = 58^\circ 45'$ .  
 $121^\circ 26' - 58^\circ 45' = 62^\circ 41' \text{ E.}$   
 13 hrs. 10 min. - 10 hrs. 30 min. = 2 hrs. 40 min.,  $\times 15 = 40^\circ$ .  
 $121^\circ 26' - 40^\circ = 81^\circ 26' \text{ W.}$   
 10 hrs. 30 min. - 5 hrs. 15 min., = 5 hrs. 15 min.,  $\times 15 = 78^\circ 45'$ ,  
 $+ 121^\circ 26' = 200^\circ 11'$ .  $360^\circ - 200^\circ 11' = 159^\circ 49' \text{ E.}$
- 27** 15 hrs. 30 min. - 7 hrs. 30' = 8 hrs.,  $\times 15 = 120^\circ$ .  
 $120^\circ - 73^\circ 32' = 46^\circ 28' \text{ E.}$
- 28** 26 hrs. - 16 hrs. = 10 hrs.,  $\times 15 = 150^\circ$ .  
 $150^\circ + 2^\circ 26' 22'' = 152^\circ 26' 22'' \text{ E.}$
- 29** 25 hrs. 25 min. - 13 hrs. 25 min. = 12 hrs.,  $\times 15 = 180^\circ$ .  
 $180^\circ - 71^\circ 3' 30'' = 108^\circ 56' 30'' \text{ E.}$
- 30** 18 hrs. 30 min - 9 hrs. 25 min. = 9 hrs. 5 min.,  $\times 15 = 136^\circ 150'$   
 $136^\circ 15' - 2^\circ 20' 22'' = 133^\circ 54' 38'' \text{ W.}$
- 31** 8 hrs. 15 min. - 7 hrs. 30 min. = 45 min.,  $\therefore 15 = 11^\circ 15'$ .  
 $95^\circ 56' - 11^\circ 15' = 84^\circ 41' \text{ W.}$
- 32** 26 hrs. 15 min. - 23 hrs. 45 min. = 2 hrs. 30 min.,  $\times 16 = 37^\circ 30'$ .  
 $73^\circ 34' - 37^\circ 30' = 36^\circ 4' \text{ W.}$
- 33** 5 hrs. 5 min.  $21\frac{3}{4}$  sec.,  $\times 15 = 76^\circ 20' 25''$ .  $76^\circ 20' 25'' - 2^\circ 20' 22''$   
 $= 74^\circ 3'' \text{ W.} = \text{New York.}$
- 34** 6 min.  $6\frac{1}{2}$  sec.,  $\times 15 = 1^\circ 31' 37\frac{1}{2}''$ ,  $+ 71^\circ 3' 30'' = 72^\circ 35' 7\frac{1}{2}'' \text{ W.}$

$$35 \quad 122^{\circ} 24' 15'' - 74^{\circ} 3'' = 48^{\circ} 24' 12'', + 15 = 3 \text{ hrs. } 13 \text{ min. } 36\frac{1}{2} \text{ sec.}$$

$$3 \text{ A.M.} + 3 \text{ hrs. } 13 \text{ min. } 36\frac{1}{2} \text{ sec.} = 13 \text{ min. } 36\frac{1}{2} \text{ sec. past } 6 \text{ A.M.}$$

$$36 \quad 37 \text{ min.} \times 15 = 9^{\circ} 15'. \quad 74^{\circ} 3'' - 9^{\circ} 15' = 64^{\circ} 45' 3'' \text{ W.}$$

$$37 \quad 11:25 \text{ P. M.} - 5:20 \text{ P. M.} = 6 \text{ hrs. } 5 \text{ min.}, \times 15 = 91^{\circ} 15'.$$

$$91^{\circ} 15' - 30^{\circ} 18' = 60^{\circ} 57' \text{ W.}$$

## ADDITION OF COMPOUND NUMBERS

194 Page 158

1	69 rds.	2 $\frac{1}{2}$ yds.		
1 mi.	14	2	2 ft.	3 in.
	16	0	0	9
	25	0	11	0
<hr/>				
1 mi.	125 rds.	3 yds.	2 ft.	0 in.

2	7 yds.	2 ft.	
	5	1 $\frac{1}{2}$	
	0	2	9 $\frac{1}{2}$ in.
	3	1	6 $\frac{1}{2}$
	4 $\frac{1}{2}$	2 $\frac{1}{2}$	
<hr/>			
	22 $\frac{1}{2}$ yds.	1 ft.	4 in. =
	22 yds.	1 ft.	10 in.

3	25 yds.	1 ft	9 in
	32	1	8
	35	6	4
	7	2	11
	0	9	0
<hr/>			
	106 yds.	0	8 = 19 rds. 1 yd. 2 ft. 2 in.

4	23 mi.	118 rds.	0 yds.	14 ft.	
	19	137	0	11	
	8	0	0	62	8 in.
	23	147	0	0	6
	0	9	0	0	7
<hr/>					
	74 mi.	96 rds.	2 yds.	0 ft.	3 in.

5	22 rds.	2 yds.	2 ft.	0 in.
	18	4	2	0
	22	6	1	0
	16	0	4	3
	80 rds.	4 yds.	0 ft.	3 in.

6	7 mi.	59 rds.	0 yds.	6 ft.	7 in.
	8	96	0	7	8
	5	9	0	0	8
	26	87	0	8	3
	46 mi.	252 rds.	1½ yds.	2 ft.	2 in. =
	46 mi.	252 rds.	2 yds.	0 ft.	8 in.

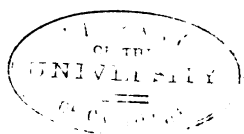
7	71 mi.	23 rds.	4½ yds.	0 ft.	0 in.
	9	17	2	2½	0
	23	0	3	0	9
	103 mi.	41 rds.	4 yds.	2½ ft.	9 in. =
	103 mi.	41 rds.	5 yds.	0 ft.	3 in.

8	1½ yds.	0 ft.	3 in.
	0	2	4
	0	3½	0
	2½ yds.	2½ ft.	7 in. =
	3	1	4

9	½ yd. = 0 yd.	1 ft.	6 in.
	0	0	3
	2	2	3
	3 yds.	1 ft.	

10	¾ mi. = 240 rds.	0 yd.	0 ft.	0 in.
	¾ rd. = 0	2	2	3
	¾ yd. =	1	6	
	¾ ft. =	0	9	
	240 rds.	3 yds.	1 ft.	6 in.

11	79 chs.	3 rds.	16 l.
	65	2	11
	33	2	6
	46	1	13
	75	0	2
	3 mi. 60 chs.	1 rd.	23 l.



<b>12</b>	75 A.	4 sq. rds.	9 sq. yds.	0 sq. ft.	72 sq. in.
	27	48	18	0	92
	7	100	29	8	139
			7	0	129

---

	109 A.	154 sq. rds.	$2\frac{1}{2}$ sq. yds.	2 sq. ft.	0 sq. in. =
	109 A.	154 sq. rds.	3 sq. yds.	6 sq. ft.	72 sq. in.

**13**  $\frac{1}{2}$  A. = 80 sq. rds.     $\frac{1}{2}$  sq. yds. = 5 sq. ft.  
 Ans. 80 sq. rds.    5 sq. ft.

<b>14</b>	$\frac{1}{2}$ A. =	96 sq. rds.	0 sq. yd.	0 sq. ft.
	$\frac{1}{4}$ sq. rd. =		13	4
	$\frac{1}{8}$ sq. yd. =			6

---

	96 sq. rds.	14 sq. yds.	1 sq. ft.
--	-------------	-------------	-----------

<b>15</b>	5 cds.	7 cd. ft.	0 cu. ft.
	2	2	12
	$7\frac{1}{2}$	6	15
	3	0	2

---

	$19\frac{1}{2}$ cds.	0 cd. ft.	13 cu. ft. =
	19 cds.	3 cd. ft.	13 cu. ft.

<b>16</b>	95 cu. yds.	26 cu. ft.	985 cu. in.
	87	19	876
	98	3	875

---

	281 cu. yds.	$22\frac{7}{8}$ cu. ft.
--	--------------	-------------------------

<b>17</b>	29 gals.	2 qts.	1 pt.
	16	3	0
	0	11	1

---

49 gals.    1 qt.    197 qts.,  $\times \$ .16 = \$19.70$ .

**18** 5825 pts. + 4285 pts. + 3426 pts. = 13,536 pts.  
 13,536 pts.  $\div 2 = 6768$  qts.,  $\times \$\frac{1}{8} = \$846$ .  
 6768 qts.  $\div 8 = 846$  pks.,  $\div 4 = 211\frac{1}{2}$  bu.

19   1 bu      0 pk      4 qts.      1 pt.  
              2               3               1  
                              27               1

---

2 bu.    2 pks.    3 qts.    1 pt. =  $83\frac{1}{2}$  qts.  
 $83\frac{1}{2}$  qts.  $\times$   $\$ \frac{1}{2}$  = \$10.44.

20   9 hrs.    15 min.  
       8        20  
      11        0  
      10        35  
       9        45  
       6        50

---

$55\frac{1}{2}$  hrs.,  $\times$   $\$.35$  = \$19.51 $\frac{1}{2}$ .

21   2 gr.      1 doz      3 units.  
              3               20  
       3        5               4

---

5 gr.    11 doz.    3 units.

22   2 bdls.    1 rm.    3 qrs.    0 shts.  
       2               0               0               17  
       1               0               1               0

---

6 bdls.    1 rm.    4 qrs.    17 shts. = 6353 shts.

23   £ 6      17 s.      5 d.  
       7        11               4  
       9        7               3

---

£ 23    16 s.      0 d. = £ 23 $\frac{1}{2}$ ,  $\times$  \$4.86 = \$115.67.

24   50 cts. + 10 cts. + 137 $\frac{1}{2}$  cts. + 95 cts. + 25 cts. = \$3.17 $\frac{1}{2}$ .

25   14 T.      13 cwt.      75 lbs.  
       25        12               26  
       2        5               14  
       17        16               29

---

60 T.      7 cwt.      44 lbs.

26	84 T.	12 cwt.	74 lbs.	6 ozs.
	23	12	26	8
	51	16	45	15
	81	5	4	7

---

241 T.      6 cwt.      51 lbs.      4 ozs.

27	5 lbs.	9 oz.	14 pwt.
	3	7	13
	2	4	11

---

11 lb.      9 oz.      18 pwt.

## SUBTRACTION OF COMPOUND NUMBERS.

195.      Page 160

1	25 A.	74 sq. rds.
	74	40
	12	117

---

112 A.      71 sq. rds.

160 A. - 112 A. 71 sq. rds. = 47 A. 89 sq. rds.

2	7 mi.	25 rds.	3 yds.	4 ft.
	3	110	4	2
	3 mi.	234 rds.	4½ yds.	2 ft. =
	3 mi.	234 rds.	5 yds.	0 ft.      6 in.

3 (14 chs. 43 l.) × (17 chs. 25 l.) = 248.91½ chs.  
 (8 chs. 11 l.) = 15 chs. = 121.65 chs.  
 248.91½ chs. - 121.65 chs. = 12 A. 7.26½ chs.

4	48 cu. yds.	12 cu. ft.	1236 cu. in.
	28	24	1500
	19 cu. yds.	14 cu. ft.	1464 cu. in.

5	4 gals.	2 qts.	0 pt.
	1	3	1
	2 gals.	2 qts.	1 pt.

- 6  $31\frac{1}{2}$  gals. + 30 gals. 1 qt. = 61 gals. 3 qt.

6 gals.	2 qts.
5	3
5	2
7	3
28	0

53 gals. 2 qts. =  $53\frac{1}{2}$  gals.,  $\times \$ .27 = \$14.44\frac{1}{2}$

61 gals. 3 qts. - 53 gals. 2 qts. = 8 gals. 1 qt.

7 cwt.	0 lb.	11 oz.
6	37	7
13 cwt.	39 lbs.	2 oz.
11	79	8
1 cwt.	59 lbs.	10 oz.

- 8 .625 lb.  $\times 12 = 7.50$  oz. - 4.25 oz. = 3.25 oz.

- 9  $\frac{1}{12}$  of 72 lbs. 12 oz. = 6 lbs. 1 oz.  
100 lbs. - 6 lbs. 1 oz. = 93 lbs. 15 oz.

- 10 1 lb. 2 oz. 5 pwt. 0 gr.  
11 11 17 18
- 
- 2 oz. 7 pwt. 6 gr.

- 11 2 lbs. 0 oz. 0 dr. 0 sc. 0 gr.  
9 1 2 7
- 
- 1 lb. 2 oz. 6 dr. 0 sc. 13 gr.

- 12 5 yrs. 2 mos. 2 wks. 1 da. 7 hrs  
3 3 0 4 3
- 
- 2 yrs. 2 mos. 1 wk. 4 da. 4 hrs.

- 13 3 mos. 0 wks. 0 da. 0 hrs. 0 min. 0 sec.  
2 4 8 19 29
- 
- 2 mos. 1 wk. 2 da. 15 hrs. 40 min. 31 sec.

- 14 31 Jan. + 28 Feb. + 31 Mar. + 30 Apr. + 31 May + 30 June  
= 181 days. 6 Dec. + 31 Jan. + 28 Feb. + 31 Mar. + 30 Apr.  
+ 31 May + 30 June + 4 July = 191 da., - 181 da. = 10 da. Ans.



15 2 wks.  $3\frac{1}{2}$  da. - .659 wk. = 1 wk. 6 da. 5 hrs. 17 min.  
16.8 sec.

16  $\$40.25 + \$21.375 + \$70.50 + \$11.64 + \$7.50 + \$8.25 + \$16 + \$38 +$   
 $\$85.914 + \$107.393 = \$406.822. \quad \$729 - 406.822 = \$322.178.$

17  $\frac{2}{3}$  of  $3\frac{1}{4}$  mi. =  $1\frac{3}{4}$  mi. +  $17\frac{1}{2}$  rds. =  $314\frac{1}{2}$  rds.  
 $314\frac{1}{2}$  rds. -  $120\frac{1}{2}$  rds. = 193 rds. 5 yds.  $8\frac{1}{2}$  in.

18 184 da. - 180 da. = 4 da.,  $\times 24 = 96$  hrs.  $\times 60 = 5760$  min.,  $\times 60 =$   
345,600 sec.

19 Sec.  $\div 3 = 32$  yrs. 3 mos. 3 wks. 0 da. 17 hrs. 24 min.  $5\frac{1}{3}$  sec.  
Fst.  $\times 4 = 12 \quad 2 \quad 1 \quad 6 \quad 12 \quad 48 \quad 28$   

---

20 yrs. 1 mo. 1 wk. 1 da. 4 hrs. 35 min.  $37\frac{1}{3}$  sec.

20  $\frac{3}{4}$  of First = 6 T. 12 cwt.  $18\frac{2}{3}$  lbs  
 $\frac{25}{100}$  T. =  $\frac{5}{100}$   

---

6 T. 7 cwt.  $18\frac{2}{3}$  lbs.

21  $\frac{3}{4}$  sq. rds. =  $5\frac{1}{2}$  sq. yds., -  $\frac{1}{4}$  sq. yd. =  $4\frac{1}{2}$  sq. yds.

22 £ 48 17 s. 6 d. 2 far.  
39 14 9 3  

---

£ 9 2 s. 8 d. 3 far.

23  $55^{\circ} 58' 40'' - 34^{\circ} 22' = 21^{\circ} 36' 40''$

24  $\frac{3}{10}$  lb.  $\times 12 = \frac{3}{10}$  oz.,  $\times 20 = 18$  pwt.  
5 lbs. 4 oz. 8 pwt. - 18 pwt. = 5 lbs. 3 oz. 10 pwt.

25 £  $\frac{1}{2}$  = 11 s.  $1\frac{1}{2}$  d.  $\frac{3}{4}$  of  $\frac{1}{2}$  s. = 6 d. 11 s.  $1\frac{1}{2}$  d. - 6 d. = 10 s.  $7\frac{1}{2}$  d.

26 46 ft.  $\times 46$  ft. = 2116 sq. ft., - 46 sq. ft. = 2070 sq. ft.



- 10**       $\frac{7 \text{ cwt. } 29 \text{ lbs. } 4 \text{ oz.}}{9}$
- 3 tons 5 cwt. 29 lbs. 4 oz. = 6563 $\frac{1}{2}$  lbs.
- $6563\frac{1}{2} \times \$ .09\frac{1}{2} = \$623.51.$
- 11**      5 mi. 19 rds.  $\frac{4 \text{ yds.}}{54}$
- $\frac{273 \text{ mi. } 105 \text{ rds. } 1 \text{ yd. } 1 \text{ ft. } 6 \text{ in.}}{\phantom{00}}$
- 12**     $13 \times 365 + 3 \text{ days} = 4748 \text{ days, } \times \$ .25 = \$1187.$
- $4748 \text{ pts. } \div 2 = 2374 \text{ qts., } \div 4 = 593 \text{ gals. } 2 \text{ qts.}$
- $593 \text{ gals. } \div 31\frac{1}{2} = 18 \text{ bbls. } 26 \text{ gals.} \quad \text{Ans. } 18 \text{ bbls. } 26 \text{ gals. } 2 \text{ qts.}$
- 13**     $\$1.25 \times 12 \times 13 = \$195 \text{ cost of milk.} \quad \$1187 - 195 \times \$992.$
- 14**     $\$1375 \div \$125 = 11. \quad 5 \text{ A. } 24 \text{ sq. rds. } 19 \text{ sq. yds. } \frac{7 \text{ sq. ft.}}{11}$
- $\frac{56 \text{ A. } 111 \text{ sq. rds. } 5\frac{1}{2} \text{ sq. yds. } 5 \text{ sq. ft.}}{56 \text{ A. } 111 \text{ sq. rds. } 5 \text{ sq. yds. } 7 \text{ sq. ft. } 36 \text{ sq. in.}}$
- 15**    5 pwt. 6 gr.  $\times 17 = 4 \text{ oz. } 9 \text{ pwt. } 6 \text{ gr.}$

## DIVISION OF COMPOUND NUMBERS

197 Page 162

- 1)  $\frac{9 \text{ mi. } 78 \text{ rds. } 4 \text{ yds. } 2 \text{ ft. } 8 \text{ in.}}{1 \text{ mi. } 8 \text{ rds. } 4 \text{ yd. } 0 \text{ ft. } 7\frac{7}{8} \text{ in.}}$
- 2)  $\frac{68 \text{ chs. } 2 \text{ rds. } 24 \text{ l.}}{11 \text{ chs. } 1 \text{ rd. } 20\frac{3}{4} \text{ l.}}$
- 3)  $\frac{16) 296 \text{ sq. rds. } 29 \text{ sq. yds. } 8 \text{ sq. ft. } 98 \text{ sq. in.}}{18 \text{ sq. rds. } 16 \text{ sq. yds. } 8 \text{ sq. ft. } 141\frac{1}{2} \text{ sq. in.}}$

- 4 
$$\begin{array}{r} 28 \overline{) 97 \text{ cds. } 11 \text{ cu. ft. } 979 \text{ cu. in.}} \\ 3 \text{ cds. } 59 \text{ cu. ft. } 1454 \frac{1}{4} \text{ cu. in.} \end{array}$$
- 5 
$$\begin{array}{r} 19 \overline{) 23 \text{ bbls. } 28 \text{ gals. } 5 \text{ qts.}} \\ 1 \text{ bbl. } 8 \text{ gals. } 0 \text{ qts. } 1 \frac{2}{3} \text{ pts.} \end{array}$$
- 6 
$$\begin{array}{r} 15 \overline{) 56 \text{ lbs. } 11 \text{ oz. } 19 \text{ pwt. } 21 \text{ gr.}} \\ 3 \text{ lbs. } 9 \text{ oz. } 11 \text{ pwt. } 23 \frac{1}{2} \text{ gr.} \end{array}$$
- 7 
$$\begin{array}{r} 95 \overline{) 87 \text{ cwt. } 0 \text{ lb. } 13 \text{ oz.}} \\ 0 \text{ cwt. } 91 \text{ lbs. } 9 \frac{1}{2} \text{ oz.} \end{array}$$
- 8 
$$\begin{array}{r} 17 \overline{) 24 \text{ yrs. } 11 \text{ mos. } 2 \text{ wks. } 3 \text{ days } 11 \text{ hrs. } 47 \text{ min.}} \\ 1 \text{ yr. } 5 \text{ mos. } 2 \text{ wks. } 3 \text{ days } 11 \text{ hrs. } 59 \text{ min. } 14 \frac{2}{3} \text{ sec.} \end{array}$$
- 9  $20,600 \text{ lbs.} \div 294 = 70 \frac{10}{147} \text{ lbs.}$
- 10  $340 \text{ lbs. } 11 \text{ oz.} \div (2 \times 54) = 6 \text{ lbs. } 4 \frac{1}{3} \text{ ozs.}$
- 11  $6 \text{ mi. sq.} = 36 \text{ sq. mi.}, \times 640 = 23,040 \text{ A.}$   
 $23,040 \text{ A.} \div 62 = 371 \text{ A. } 6 \text{ sq. chs. } 2 \text{ sq. rds. } 40 \frac{1}{2} \text{ sq. l.}$
- 12  $39 \text{ sq. rds.} \times 30 \frac{1}{2} + 2 \text{ sq. yds.} = 1181 \frac{1}{2} \text{ sq. yds.}, \times 9 + 6 \text{ sq. ft.} =$   
 $10,641 \frac{1}{2} \text{ sq. ft.}, \times 144 + 128 \text{ sq. in.} = 1,532,540 \text{ sq. in.}$   
 $11 \text{ rds.} \times 16 \frac{1}{2} + 2 \text{ ft.} = 183 \frac{1}{2} \text{ ft.}, \times 12 + 8 \text{ in.} = 2210 \text{ in.}$   
 $1,532,540 \text{ sq. in.} \div 2210 \text{ in.} = 693 \frac{10}{11} \text{ in., width.}$   
 $693 \frac{10}{11} \text{ in.} = 3 \text{ rds. } 2 \text{ yds. } 2 \text{ ft. } 3 \frac{10}{11} \text{ in. Ans.}$
- 13  $120 \text{ cu. yds. } 5 \text{ cu. ft.} \div (5 \times 4) = 6 \text{ cu. yds. } 432 \text{ cu. in. or } 162$   
 $\text{cu. ft. } 432 \text{ cu. in.}$
- 14  $2 \text{ gals.} \times 4 + 3 \text{ qts.} = 11 \text{ qts.}, \times 2 + 1 \text{ pt.} = 23 \text{ pts.}$   
 $23 \text{ pts.} \times 2 = 46 \text{ half pts.}$
- 15  $5280 \text{ ft.} \div 30 = 176, \times 2 = 352 \text{ rails.}$

## REVIEW OF COMPOUND NUMBERS

198 Page 163

- 1 2 hrs. 55 min. = 175 min.  $175 \times 59 \times 4\frac{1}{2}$  ft. = 45,602 $\frac{1}{2}$  ft.  
 $45,602\frac{1}{2}$  ft.  $\div 5280 = 8$  mi.  $3362\frac{1}{2}$  ft.  $3362\frac{1}{2}$  ft.  $\div 3 = 1120$   
yds.  $2\frac{1}{2}$  ft.  $1120$  yds.  $\div 5\frac{1}{2} = 203$  rds.  $3\frac{1}{2}$  yds. 8 mi. 203 rds.  
 $3\frac{1}{2}$  yds.  $2\frac{1}{2}$  ft. = 8 mi. 203 rds. 4 yds. 7 in.
- 2 1 mi. 8 rds. = 328 rds.,  $\times 16\frac{1}{2} = 5412$  ft.  $5412$  ft.  $\times 3$  ft.  $\times 2$  ft.  
= 32,472 cu. ft.  $32,472$  cu. ft.  $\div 27 = 1202$  cu. yds. 18 cu. ft.
- 2 **Metric.**  $1649.58$  m.  $\times .914$  m.  $\times 609$  m. = 918.19911708 cu.  
m. or steres.  $918.19911708$  steres  $\times 1.308$  cu. yd. = 1201.004  
cu. yd.
- 3  $855.95 \div 1.50 = 570$  cwt.  $63\frac{1}{2}$  lbs.
- 4 11 min. 45 sec. = 705 sec. 11 hrs. = 39,600 sec.  
 $39,600 \div 705 = 56\frac{4}{7}$  mi.
- 4 **Metric.**  $1609.34$  m.  $\times 56\frac{4}{7}$  = 90,396.97.
- 5 3 ft. 2 in. = 38 in.; 2 ft. 10 in. = 34 in.;  $38$  in.  $\times 34$  in.  $\times 5$  in.  
= 6460 cu. in. 1 ft. 4 in. = 16 in.;  $3$  ft. = 36 in.  $16$  in.  $\times 36$   
in.  $\times 5$  in. = 2880 cu. in.  $6460$  cu. in. + 2880 cu. in. = 9340 cu.  
in.,  $\div 1728 = 5$  cu. ft. 700 cu. in.
- 5 **Metric.**  $.965$  m.  $\times .863$  m.  $\times .127$  m. = .105764965 cu. m.  
 $.406$  m.  $\times .91$  m.  $\times .127$  m. = .04692142 cu. m.  
 $.105764965$  cu. m. + .04692142 cu. m. = .152686385 cu. m.
- 6 3 ft.  $\times 2\frac{1}{2}$  ft.  $\times 2 = 14$  sq. ft.  $2\frac{1}{2}$  ft.  $\times 1 \times 2 = 4\frac{1}{2}$  sq. ft. 3 ft.  $\times 1$   
ft.  $\times 2 = 6$  sq. ft.  $14$  sq. ft. +  $4\frac{1}{2}$  sq. ft. + 6 sq. ft. =  $24\frac{1}{2}$  sq. ft.,  
surface of second block. 4 ft.  $\times 4$  ft.  $\times 6 = 96$  sq. ft., surface  
of first block.  $96$  sq. ft. +  $24\frac{1}{2}$  sq. ft. =  $120\frac{1}{2}$  sq. ft.

- 7  $640 \text{ A.} \times 160 = 102,400 \text{ sq. rds.}, \times 30\frac{1}{4} = 3,097,600 \text{ sq. yds.}, \times 9 = 27,878,400 \text{ sq. ft.}, \times 144 = 4,014,489,600 \text{ sq. in.}$
- 7 **Metric.**  $640 \text{ A.} \div 2.47 \text{ A.} = 259.10921 \text{ hectares.}$
- 8  $16 \text{ ft.} \times 5 \text{ ft.} \times 3\frac{1}{2} \text{ ft.} = 280 \text{ cu. ft.}, \div 128 = 2\frac{1}{4} \text{ cd.}$
- 8 **Metric.**  $4.87 \text{ m.} \times 1.06 \text{ m.} \times 1.52 \text{ m.} = 7.846544 \text{ cu. m. or steres}$
- 9  $9\frac{3}{4} \text{ A.} \times 160 = 1560 \text{ sq. rds.}, \div 260 = 6 \text{ rds.}$
- 10  $16 \text{ pwt. } 11 \text{ grs.} = 395 \text{ grs.} \quad 5 \text{ lbs. } 1 \text{ pwt. } 11 \text{ grs.} = 28,835 \text{ grs.}$   
 $28,835 \div 395 = 73.$
- 10 **Metric.**  $1872.4 \text{ gr.} \div 25.649 \text{ gr.} = 73 \text{ spoon, (23 gr. remaining).}$
- 11 

7 yrs.	0 mo.	0 wks.	0 da.	0 hrs.	0 min.	0 sec.
	1	2	3	11	35	42
<hr/>						
6 yrs.	10 mos.	1 wk.	3 da.	12 hrs.	24 min.	18 sec.
- 12  $(480 \text{ rds.} + 330 \text{ rds.}) \times 2 = 1620 \text{ rds.}, \times 16\frac{1}{2} = 26,730 \text{ ft.}, \div 24\frac{3}{4} = 108. \quad 108 \text{ posts} \times \$ .12\frac{1}{2} = \$135.$
- 13  $1620 \text{ (rds.)} \times 3 \times 1\frac{1}{2} \text{ lbs.} = 7290 \text{ lbs.}, \times \$ .05\frac{1}{2} = \$400.95.$
- 14  $32 \text{ gals.} \times \$ .17 = \$5.44 \text{ cost.}$   
 $32 \text{ gals.} - (.06\frac{1}{4} \times 32) = 30 \text{ gals.} \quad 15 \text{ gals.} \times \$ .29 = \$4.35; \quad 5 \text{ gals.} \times \$ .27 = \$1.35. \quad 8\frac{3}{4} \text{ gals.} \times \$ .26 = \$2.27\frac{1}{2}; \quad 1\frac{1}{4} \text{ gals.} \times \$ .28 = \$ .35.$   
 $\$4.35 + \$1.35 + \$2.27\frac{1}{2} + \$ .35 = \$8.32\frac{1}{2} \text{ selling price}$   
 $\$8.32\frac{1}{2} \text{ S. P.} - \$5.44 \text{ C.} = \$2.88\frac{1}{2} \text{ profit.}$
- 15  $660 \text{ ft.} \div 5280 \text{ ft.} = \frac{1}{8} = .125 \text{ mi.}$
- 16  $4 \times \$31.75 = \$127. \quad \$127 + \$175 + \$17.50 + \$18.42 = \$337.92.$   
 $\$337.92 \div \$1.50 = 225.28 \text{ cents.}$

- 17  $9\frac{1}{4}$  cd. +  $7\frac{1}{2}$  cd. =  $16\frac{3}{4}$  cd.,  $\times 128 = 2144$  cu. ft. 8964 cu. ft. - 2144 cu. ft. = 6820 cu. ft. 6820 cu. ft.  $\div 128 = 53\frac{3}{4}$  cd.,  $53\frac{3}{4}$  cd.  $\times \$7.25 = \$386.29$ .
- 17 **Metric.** 33.514492 steres + 27.173913 steres = 60.688405 steres.  
253.736413 steres - 60.688405 steres = 193.048008 steres.  
193.048008 steres.  $\times \$2.001 = \$386.289$ .
- 18 7 mi. 148 rd.  $\times 365 = 2723\frac{1}{2}$  mi.
- 18 **Metric.** 1609.372 m.  $\times 365 = 587,420.78$  m.
- 19
- |                        |       |         |       |
|------------------------|-------|---------|-------|
| $\frac{1}{2}$ lb. =    | 9 oz. | 12 pwt. | 0 gr. |
| $4\frac{1}{2}$ oz. =   | 4     | 16      | 16    |
| $31\frac{1}{2}$ pwt. = | 0     | 31      | 8     |
- 
- 1 lb. 4 oz. - 11 pwt. 3 gr. = 1 lb. 3 oz. 8 pwt. 21 gr.
- 20 2 lb.  $\times 12 + 6$  oz. = 30 oz.,  $\times 20 + 17$  pwt. = 617 pwt.,  $\times 24 + 12$  gr. = 14,820 gr.  $\div 25.8 = \$574.41$ .
- 20 **Metric.** 961.5584 grs.  $\div 1.6753$  grs. = \$573.96.
- 21 320 rds.  $\div 12 = 26\frac{2}{3}$  rds. to block,  $\times 16\frac{1}{2} = 440$  rds.  
6 yds.  $2\frac{1}{2}$  cu. ft.  $\times 440 = 2680$  cu. yds. 20 cu. ft.
- 22 6 gals.  $\times 8 = 48$  pts.  $\times 9 = 432$  pts. 35 pts. + 96 pts. + 276 pts. +  $11\frac{1}{2}$  pts. =  $13\frac{1}{2}$  pts. = 6 qts.  $1\frac{1}{2}$  pts.
- 23  $16\frac{1}{2}$  ft.  $\times 5\frac{1}{2}$  ft.  $\times 1$  ft. = 90.75 cu. ft.
- 24  $10 \times 43560$  sq. ft. = 435,600 sq. ft.,  $\times \frac{3}{4} = 326,700 \div (45 \times 150 = 6750) = 48\frac{2}{3}$  lots.

$$25 \quad 24 \times (11 \text{ pwt. } 3 \text{ gr.}) = 264 \text{ pwt. } 552 \text{ gr.} = 14\frac{7}{10} \text{ oz., } \times \$1.60 = \$22.96.$$

$$25 \quad \text{Metric.} \quad 24 \times 18.636 \text{ gr.} = 447.264 \text{ gr., } \div 31.168 \text{ gr.} = 14.35 \text{ spoons, } \times \$.50 = \$7.17\frac{1}{2}.$$

$$26 \quad 98 \text{ bbl.} \times 31\frac{1}{2} \text{ gal.} = 3087 \text{ gal., } \times (6 - 4) = 1543\frac{1}{2} \text{ min.} \\ 1543\frac{1}{2} \text{ min.} = 1 \text{ da. } 1 \text{ hr. } 43 \text{ min. } 30 \text{ sec.}$$

$$27 \quad \text{Quarter Section.} = 160 \text{ A.} \times 160 = 25,600 \text{ sq. rd.} - (17 \times 17 \text{ sq. rd.}) = 25,311 \text{ sq. rd.} = 158 \text{ A. } 31 \text{ sq. rd.}$$

$$28 \quad 15 \text{ ft.} \div 8 \text{ ft.} = 1\frac{7}{8} \text{ cd., } \times \$9.75 = \$18.28.$$

$$29 \quad 8\frac{1}{2} \text{ ft.} \div 3 \text{ ft.} = 2\frac{3}{4} \text{ ft.} \quad 5280 \text{ ft.} \div 8\frac{1}{2} = 640 \text{ revolutions of large wheel.} \\ 640 \times 2\frac{3}{4} = 1760 \text{ revolutions small wheel.} \\ 1760 - 640 = 1120 \text{ times.}$$

30	$\frac{1}{2} \text{ A.} = 80 \text{ sq. rd.}$	$0 \text{ sq. yd.}$	$0 \text{ sq. ft.}$	$0 \text{ sq. in.}$
	79	7	6	98
	$22\frac{1}{2} \text{ sq. yd.} \quad 2 \text{ sq. ft.} \quad 46 \text{ sq. in.} =$			
	$22 \text{ sq. yd.} \quad 4 \text{ sq. ft.} \quad 82 \text{ sq. in.}$			

$$31 \quad 27 \text{ ft.} = 9 \text{ yd., } \div \frac{3}{4} = 12 \text{ strips.} \quad 12 \text{ ft.} = 4\frac{2}{3} \text{ yds.} \\ 12 \times 4\frac{2}{3} \text{ yds.} = 56 \text{ yds.}$$

$$32 \quad (15 \text{ ft.} + 11\frac{1}{2} \text{ ft.}) \times 9 \text{ ft.} \times 2 = 472\frac{1}{2} \text{ sq. ft. sides.} \\ 15 \text{ ft.} \times 11\frac{1}{2} \text{ ft.} = 168\frac{3}{4} \text{ sq. ft. ceiling.} \\ \hline 641\frac{1}{2} \text{ sq. ft. sides and ceiling.} \\ 6\frac{3}{4} \text{ ft.} \times 3 \times 2 = 40 \text{ sq. ft. doors.} \\ 2\frac{1}{2} \text{ ft.} \times 6 \times 3 = 39 \text{ sq. ft. windows.} \\ \hline 79 \div 2 = 39\frac{1}{2} \text{ sq. ft. allowance.} \\ 641\frac{1}{2} \text{ sq. ft.} - 39\frac{1}{2} \text{ sq. ft.} = 601\frac{1}{2} \text{ sq. ft., } \div 9 = 66\frac{1}{3} \text{ yds.} \\ 66\frac{1}{3} \text{ yds.} \times \$.32 = \$21.395.$$



33  $9\frac{1}{2}$  ft.  $\times$   $6\frac{1}{2}$  ft.  $\times$   $4\frac{1}{2}$  ft. =  $278\frac{1}{8}$  cu. ft.

34  $\frac{1}{2}$  of First = 1 A.    79 sq. rd.    21 sq. yd.    8 sq. ft.    13 sq. in.  
                               100                24                7                96

---

                              138 sq. rd.     $27\frac{1}{4}$  sq. yd.    0 sq. ft.    61 sq. in.  
                               = 138 sq. rd.    27 sq. yd.    2 sq. ft.    99 sq. in.

35  $118^\circ$         18'        00' Los Angeles.  
       87        37        30 Chicago.

---

15  $)30^\circ$         40'        30"  
           2 hrs.    2 min.    42 sec.

10 hrs. - 2 hrs. 2 min. 42 sec. = 7 hrs. 57 min. 18 sec. A. M.

36  $58^\circ$         22' W.  
       18        28 E.

---

15  $)76^\circ$         50'  
           5 hrs.    7 min.    20 sec.  
           6 hrs.    30 min.

---

11 hrs.    37 min.    20 sec. A. M.

37  $9 \times 24 = .375$

38  $\frac{1}{2}$  mi. = 200 rd.        0 ft.        0 in.  
        $\frac{1}{4}$  rd. = 0            5            6  
        $\frac{1}{2}$  ft. = 0            0            10

---

200 rds.    6 ft.    4 in.

38 Metric.  $1005.84$  m. +  $1.67$  m. +  $.25$  m. =  $1007.76$  m. Ans.

39  $7$  ft.  $\times$   $4$  ft. =  $28$  sq. ft.     $105$  cu. ft.  $\div$   $28$  sq. ft. =  $3\frac{3}{4}$  ft.

40  $(16$  ft. +  $22$  ft.)  $\times$   $2\frac{3}{8}$  ft.  $\times$   $2$  =  $215\frac{1}{8}$  sq. ft.  
 $41\frac{1}{2}$  ft.  $\times$   $2\frac{3}{8}$  ft.  $\times$   $3$  =  $41\frac{1}{2}$  sq. ft.     $215\frac{1}{8}$  sq. ft. -  $41\frac{1}{2}$  sq. ft. =  
 $173\frac{1}{4}$  sq. ft.,  $\times$   $\$.06$  =  $\$10.41\frac{1}{4}$ .

41  $2\frac{2}{3}$  yds.  $\div$   $\frac{1}{3}$  =  $9\frac{2}{3}$  = 10 strips.  $18$  ft. =  $6$  yds.  $10 \times 6$  yds. =  $60$  yds.

- 41 Metric.**  $5.48 \text{ m.} \times 6.70 \text{ m.} = 36.716 \text{ sq. m.} \div .68 \text{ m.} = 58.994 \text{ m.}$
- 42**  $11 \text{ ft. } 11 \text{ in.} = 1\frac{11}{8} \text{ yd.} = 3\frac{1}{8} \text{ yd.} = 4 \text{ strips.}$   
 $17 \text{ ft. } 10 \text{ in.} = 1\frac{10}{8} \text{ yd. } 1\frac{10}{8} \text{ yd.} \times 4 = 23\frac{1}{2} \text{ yd.}$
- 43**  $60 \text{ ft.} = 20 \text{ yd. } 80 \text{ ft.} = 26\frac{2}{3} \text{ yd. } 24 \text{ ft.} = 8 \text{ yd. } 20 \text{ ft.} = 6\frac{2}{3} \text{ yd.}$   
 $36 \text{ ft.} = 12 \text{ yd. } 20 \text{ strips} \times 36\frac{2}{3} \text{ yd.} = 533\frac{1}{3} \text{ yds. } 8 \text{ strips} \times 6\frac{2}{3} \text{ yd.} = 53\frac{1}{3} \text{ yd.}$   
 $12 \text{ strips} \times 6\frac{2}{3} \text{ yd.} = 80 \text{ yds. } 533\frac{1}{3} \text{ yd.} + 10 \text{ yd.} + 53\frac{1}{3} \text{ yd.} + 80 \text{ yd.} = 676\frac{2}{3} \text{ yd.,} \times \$1.50 = \$1015.$
- 44**  $2 \times 170 \text{ lb.} = 340 \text{ lb.} \times 12 = 4080 \text{ oz. } \$3700 \div 4080 = \$.906.$
- 45**  $26 \text{ ft.} - 2 \text{ ft. (border)} = 24 \text{ ft.} = 8 \text{ yd. } 8 \text{ yd.} \div \frac{1}{4} \text{ yd.} = 11 \text{ strips.}$   
 $17 \text{ ft.} - 2 \text{ ft. (border)} = 15 \text{ ft.} = 5 \text{ yds.} \times 11 + 1\frac{1}{4} \text{ matching} = 55\frac{1}{4} \text{ yds.}$   
 $(26 \text{ ft.} + 17 \text{ ft.}) \times 2 = 86 \text{ ft.} = 28\frac{2}{3} \text{ yds. edging.}$   
 $55\frac{1}{4} \text{ yds.} + 28\frac{2}{3} \text{ yds.} = 84\frac{1}{12} \text{ yds.} \times \$1.95 = \$209.04.$
- 46**  $1 \text{ mi.} = 1760 \text{ yd. } 1\frac{1}{11}\frac{1}{2} = \frac{1}{2}.$
- 47**  $\frac{1}{4} \text{ of } .225 \text{ mi.} = .18 \text{ mi.} \times 320 = 57\frac{1}{2} \text{ rd. } \frac{1}{2} \text{ rd.} \times 16\frac{1}{2} = 9\frac{1}{4} \text{ ft.}$   
 $\frac{1}{4} \text{ ft.} \times 12 = 10\frac{1}{2} \text{ in. } \text{Ans. } 57 \text{ rd. } 9 \text{ ft. } 10\frac{1}{2} \text{ in.}$
- 48**  $1\frac{1}{2} \text{ cd. ft.} \div 8 = \frac{1}{4} \text{ cd.}$
- 49**  $(22 \text{ ft.} + 16 \text{ ft.}) \times 9 \text{ ft.} \times 2 = 684 \text{ sq. ft.,} \div 9 = 76 \text{ sq. yd.} - 20 \text{ sq. yd.} = 56 \text{ sq. yd.}$   
 $8 \text{ yd.} \times 1\frac{1}{2} \text{ ft.} = 4 \text{ sq. yd. to roll.}$   
 $56 \text{ sq. yd.} \div 4 \text{ sq. yd.} = 14 \text{ rolls,} \times \$.87\frac{1}{2} = \$12.25.$
- 50**  $2 \text{ T. } 7 \text{ cwt. } 28 \text{ lb.} = 4728 \text{ lb. } 5 \text{ cwt. } 91 \text{ lb.} = 591 \text{ lb.}$   
 $591 \div 4728 = \frac{1}{8}.$
- 51**  $396 \text{ sq. rd. } 21 \text{ sq. yd.} = 2 \text{ A. } 76 \text{ sq. rd. } 21 \text{ sq. yd.} = 2\frac{1}{4}\frac{1}{4} \text{ A.} \times \$605 - \$1500 \text{ Offered. } 16 \times \$175 = \$2800 \text{ Received.}$   
 $\$2800 - \$1500 = \$1300. 360 \text{ ft.} \div 8 = 45 \text{ ft. wide.}$

## UNITED STATES MONEY

199. Page 169

**22**  $\$16 \div \frac{1}{8} = 256 \text{ lb.}$

**23**  $\$48.75 \div \frac{1}{4} = 39 \text{ books.}$

**24**  $874 \times \frac{1}{8} = \$54.62\frac{1}{2}.$

**25**  $\$16 \div \frac{1}{4} = 64 \text{ lbs.}$

**26**  $84 \times \frac{1}{8} = \$10.50.$

**27**  $648 \times \frac{1}{8} = \$81.00.$

**28**  $\$19 \div \frac{1}{8} = 152 \text{ lb.}$

**29**  $976 \times \frac{3}{4} = \$732.$

**30**  $879 \times 1\frac{1}{2} = \$1230.60.$

**31**  $\$40 \div \frac{7}{8} = 45\frac{5}{7} \text{ yd.}$

**32**  $\$9\frac{1}{3} \div \$\frac{2}{3} = 14 \text{ chickens.}$

**33**  $376 \times \$\frac{3}{8} = \$141.$

**34**  $\$32 \div \frac{1}{8} = 512 \text{ bags.}$

**35**  $\$357 \div 12\frac{3}{4} = 28 \text{ T.}$

**36**  $7212 \times \frac{1}{12} = \$601.$

**37**  $18 \times 1\frac{1}{4} = \$22.50.$

**38**  $189 \times \$\frac{1}{3} = \$63.$

**39**  $\$26\frac{7}{8} \div \frac{5}{8} = 43 \text{ lbs.}$

**40**  $\$95 \div \$4\frac{3}{4} = 20 \text{ sheep.}$

**41**  $408 \times \$1\frac{7}{8} = \$765.$

**42**  $248 \times \$1\frac{5}{8} = \$403.$

**43**  $100 \div \frac{7}{8} = 114\frac{2}{7} \text{ rolls.}$

**44**  $249 \times \$2\frac{2}{3} = \$664.$

**45**  $726 \times \$\frac{5}{8} = \$605.$

- 46  $97.856 \text{ M.} \times \$19 = 1859.264.$
- 47  $785.469 \text{ M.} \times \$8 = \$6283.75.$
- 48  $98.56 \text{ cwt.} \times \$6 = \$591.36.$
- 49  $7643.98 \text{ cwt.} \times \$2\frac{1}{2} = \$18,345.55.$
- 50  $439.86 \text{ cwt.} \times \$\frac{70}{100} = \$307.90.$
- 51  $\$95 \div \$1\frac{1}{4} = 76 \text{ cwt.}$
- 52  $75.43 \text{ cwt.} \times \$2\frac{1}{2} = \$188.575.$
- 53  $98,756 \text{ lb.} = 49.378 \text{ T.,} \times \$12 = \$592.54.$
- 54  $8 \div 12 = \frac{2}{3}. \quad \frac{2}{3} \text{ of } 2000 \text{ lb.} = 1333\frac{1}{3} \text{ lb.}$
- 55  $1975 \text{ lb.} + 1125 \text{ lb.} + 1240 \text{ lb.} = 4340 \text{ lb.}$   
 $4340 \text{ lb.} \div 2000 = 2.17 \text{ T.,} \times \$12\frac{1}{2} = \$27.67.$
- 56  $1 \text{ lb. Troy} = 5760 \text{ gr.} \quad 25.8 \text{ gr.} - (\frac{1}{10} \text{ of } 25.8) = 23.22 \text{ gr.}$   
 $5760 \div 23.22 \text{ gr.} = \$248\frac{1}{11}.$
- 57  $(412.5 \text{ gr.} - \frac{1}{10} \text{ of } 412.5 \text{ gr.}) = 371\frac{1}{4} \text{ gr.}$   
 $5760 \text{ gr.} \div 371\frac{1}{4} \text{ gr.} = \$15.52.$
- 58  $7 \text{ lb.} \times 12 + 11 \text{ oz.} = 95 \text{ oz.,} \times 20 + 18 \text{ pwt.} = 1918 \text{ pwt.,} \times 24 +$   
 $3 \text{ gr.} = 46,035 \text{ gr.,} \div 371\frac{1}{4} \text{ gr.} = \$124.$
- 59  $1 \text{ lb.} = 12 \text{ oz.,} \times 20 + 1 \text{ pwt.} = 241 \text{ pwt.,} \times 24 + 21 \text{ gr.} = 5805 \text{ gr.}$   
 $5805 \text{ gr.} \div 23.22 \text{ gr.} = \$250.$
- 60  $2 \text{ lb.} \times 12 = 24 \text{ oz.,} \times 20 + 3 \text{ pwt.} = 483 \text{ pwt.,} \times 24 + 18 \text{ gr.} =$   
 $11,610 \text{ gr.} \quad 11,610 \text{ gr.} \div 23.22 \text{ gr.} = \$500, \div 10 = 50 \text{ eagles.}$

- 61  $6 \text{ lb.} \times 12 = 72 \text{ oz.}, \times 20 + 6 \text{ pwt.} = 1446 \text{ pwt.} \times 24 + 18 \text{ gr.} = 34,722 \text{ gr.}$   $\frac{1}{2}$  of  $385.8 - \frac{1}{10}$  of  $192.9 = 173.61 \text{ gr.}$   
 $34,722 \text{ gr.} \div 173.61 \text{ gr.} = 200 \text{ half dollars.}$
- 62  $1 \text{ lb.} \times 12 + 6 \text{ oz.} = 18 \text{ oz.}, \times 20 + 1 \text{ pwt.} = 361 \text{ pwt.}, \times 24 + 16\frac{1}{2} \text{ gr.} = 8680\frac{1}{2} \text{ gr.}$   $\frac{1}{4}$  of  $385.8 - \frac{1}{10}$  of  $96.45 = 86.805 \text{ gr.}$   
 $8680.5 \text{ gr.} \div 86.805 \text{ gr.} = 100 \text{ quarters.}$
- 63  $3 \text{ lb.} \times 12 = 36 \text{ oz.}, \times 20 + 3 \text{ pwt.} = 723 \text{ pwt.}, \times 24 + 9 \text{ gr.} = 17,361 \text{ gr.}$   $\frac{1}{10}$  of  $385.8 \text{ gr.} - \frac{1}{10}$  of  $38.58 \text{ gr.} = 34.722 \text{ gr.}$   
 $17,361 \text{ gr.} \div 34.722 \text{ gr.} = 500 \text{ dimes.}$
- 64  $9 \text{ lb.} \times 12 + 2 \text{ oz.} = 110 \text{ oz.}, \times 20 + 8 \text{ pwt.} = 2208 \text{ pwt.}, \times 24 = 52,992 \text{ gr.}$   $52,992 \text{ gr.} \times .975 = 51,667.2 \text{ gr. pure silver.}$   
 $51,667.2 \text{ gr.} \div 173.61 \text{ gr.} = 297.6 \text{ half dollars.}$
- 65  $3 \text{ lb.} \times 12 + 8 \text{ oz.} = 44 \text{ oz.}, \times 20 + 11 \text{ pwt.} = 891 \text{ pwt.}, \times 24 = 213,840 \text{ gr.}$   $2\frac{1}{2} \times 258 \text{ gr.} - \frac{1}{10}$  of  $64.50 = 58.05 \text{ gr.}$   
 $213,840 \text{ gr.} \div 58.05 \text{ gr.} = 368\frac{1}{3} \text{ pieces.}$

## GENERAL ANALYSIS

200 Page 173

- 1  $18 : 30 :: 45 : (75);$  or,  $\frac{4}{3} \times 30 = \$75.$
- 2  $15 : 7 :: 15 : (7);$  or,  $15 \times \frac{7}{15} = 7 \text{ days.}$
- 3  $48 : 84 :: 108 : (189);$  or,  $\frac{10}{8} \times 84 = \$189.$
- 4  $24 : 22 :: 564 : (517);$  or,  $\frac{5}{24} \times 22 = 517 \text{ mi.}$
- 5  $160 : 175 :: 96 : (105);$  or,  $\frac{9}{16} \times 175 = 105 \text{ T.}$

- 6  $50:18::75:(27)$ ; or,  $\frac{75}{3} \times 18 = 27$  A.
- 7  $112.50:90::50:(40)$ ; or,  $\frac{50}{112.50} \times 90 = 40$  chairs.
- 8  $8\frac{1}{2}:12\frac{1}{2}::17.50:(25)$ ; or,  $17.50 \times \frac{4}{3} \times \frac{1}{2} = \$25$ .
- 9  $78:58\frac{1}{2}::12:(9)$ , or,  $\frac{1}{2} \times \frac{1}{2} = 9$  men.
- 10  $24:32::18:(24)$ ; or,  $18 \times \frac{3}{2} = 24$  men.
- 11  $18:42::61.20:(142.80)$ ; or,  $\frac{61.20}{18} \times 42 = \$142.80$ .
- 12  $30:100::3.75:(12.50)$ ; or,  $\frac{3.75}{30} \times 100 = \$12.50$ .
- 13  $12:10::14:(11\frac{2}{3})$ ; or,  $14 \times \frac{1}{2} = 11\frac{2}{3}$  days.
- 14  $12:22::486:(891)$ ; or,  $\frac{4}{3} \times 22 = \$891$ .
- 15  $486:891::12:(22)$ ; or,  $\frac{1}{3} \times 891 = 22$  cows.
- 16  $44\frac{1}{2}:33\frac{1}{2}::9\frac{1}{2}:(7\frac{1}{2})$ ; or,  $\frac{1}{2} \times \frac{1}{3} \times \frac{1}{2} = 7\frac{1}{2}$  yds.
- 17  $\left. \begin{matrix} 12:15 \\ 480:300 \end{matrix} \right\} :: 720:(562.50)$ ; or,  $720 \times \frac{1}{2} \times \frac{1}{2} = \$562.50$ .
- 18  $\left. \begin{matrix} 16:18 \\ 4:2 \end{matrix} \right\} :: 640:(360)$ ; or,  $640 \times \frac{1}{2} \times \frac{1}{2} = \$360$ .
- 19  $130:80::117:(72)$ ; or,  $\frac{1}{3} \times 80 = \$72$ .
- 20  $108:81::120:(90)$ ; or,  $120 \times 81 \div 108 = 90$  horses.
- 21  $\left. \begin{matrix} 9:12 \\ 8:9 \end{matrix} \right\} :: 12:(18)$ ; or,  $12 \times \frac{1}{2} \times \frac{2}{3} = 18$  days.
- 22  $1.90:580::20:(4000)$ ; or,  $\frac{3}{10} \times 380 = 4000$  lbs.
- 23  $1:\frac{1}{2}::27:(20\frac{1}{2})$ ; or,  $27 \times \frac{1}{2} = 20\frac{1}{2}$  yds.

$$24 \quad \left. \begin{array}{l} 9\frac{1}{2} : 10 \\ \frac{1}{4} : 1\frac{1}{4} \end{array} \right\} :: 11.40 : (20); \text{ or, } 11.40 \times \frac{1}{1\frac{1}{4}} \times \frac{1}{\frac{1}{4}} \times 10 \times \frac{1}{4} = \$20.$$

$$25 \quad \left. \begin{array}{l} 6 : 9 \\ 60 : 80 \end{array} \right\} :: 12 : (24); \text{ or, } \frac{1}{2} \times \frac{3}{2} \times 9 = 24 \text{ days}$$

$$26 \quad 4\frac{1}{2} : 3\frac{3}{4} :: 12 : (9); \text{ or, } 12 \times \frac{2}{3} \times \frac{1}{2} = 9 \text{ brooms.}$$

$$27 \quad 42 : 35 :: 6 : (5); \text{ or, } \frac{4}{12} \times 35 = 5 \text{ men.}$$

$$28 \quad \left. \begin{array}{l} 10 : 7 \\ 28 : 25 \\ 10 : 8 \end{array} \right\} :: 2 : (1); \text{ or, } 2 \times \frac{1}{28} \times \frac{7}{10} \times \frac{25}{8} = 1 \text{ day.}$$

$$29 \quad \left. \begin{array}{l} 14 : 16 \\ 12 : 14 \end{array} \right\} :: 42 : (56); \text{ or, } \frac{14}{12} \times \frac{16}{14} \times 14 = \$56.$$

$$30 \quad 11\frac{1}{2} : 10\frac{1}{2} :: 3.45 : (3.15); \text{ or, } 3.45 \times \frac{1}{2} \times \frac{1}{2} = \$3.15.$$

$$31 \quad 10\frac{1}{2} : 8\frac{1}{4} :: 12\frac{1}{4} : (10\frac{3}{4}); \text{ or, } \frac{4}{4} \times \frac{2}{21} \times \frac{1}{2} = 10\frac{3}{4} \text{ ft.} = 10 \text{ ft. } 2\frac{1}{2} \text{ in.}$$

$$32 \quad 5\frac{1}{12} : 3\frac{1}{3} :: 16\frac{1}{4} : (10); \text{ or, } \frac{5}{4} \times \frac{1}{3} \times \frac{1}{3} = 10 \text{ ft.}$$

$$33 \quad \left. \begin{array}{l} 18 : 4 \\ 12\frac{1}{4} : 237\frac{1}{13} \end{array} \right\} :: 3\frac{1}{4} : (14); \text{ or, } \frac{1}{2} \times \frac{1}{13} \times \frac{1}{2} \times \frac{1}{13} = 14 \text{ days.}$$

$$34 \quad \left. \begin{array}{l} 36 : 44 \\ 22 : 14 \\ 7 : 12 \end{array} \right\} :: 24 : (32); \text{ or, } \frac{2}{3} \times \frac{1}{12} \times \frac{1}{4} \times 12 = 32 \text{ gal.}$$

$$35 \quad \frac{1}{11} : \frac{1}{7} :: 198 : (238); \text{ or, } 198 \times \frac{1}{11} \times \frac{1}{7} = \$238.$$

$$36 \quad 14 \text{ lbs.} : 2072 \text{ lbs.} :: 1 : (148); \text{ or, } \frac{1}{14} \times 2072 = \$148$$

$$37 \quad 7 \times 5 \times \frac{3}{8} \div .15 = 87\frac{1}{2} \text{ doz.}$$

$$38 \quad .717 \text{ M} \times 15 \div .045 = 239 \text{ lbs.}$$

$$39 \quad 150 \times \frac{1}{10} \times 1.20 \div .07\frac{1}{2} = 3000 \text{ sacks.}$$

$$40 \quad 3 \times 60 \times \frac{7}{5} = 84 \text{ weeks.}$$

$$41 \quad 12 \times 1.75 = \$21; \quad 80 \times .01\frac{1}{4} = \$1. \quad 21 \div 1 = 21 \text{ sacks.}$$

## PARTNERSHIP

201 Page 178

- 1  $\$2500 + \$1500 = \$4000$ . A's share =  $\frac{2}{3}$ , or  $\frac{2}{3}$  of  $\$1840 = \$1150$ .  
B's " =  $\frac{1}{3}$ , or  $\frac{1}{3}$  of  $\$1840 = \$690$ .
- 2  $\frac{1}{3} - \frac{1}{4} = \frac{1}{12}$  B's share.  $\frac{1}{12}$  of  $\$637 = \$245$  A's loss.  
 $\frac{1}{12}$  of  $\$637 = \$392$  B's loss.
- 3  $40 \times 11 = 440$ . A's share  $\frac{4}{9}$  of  $\$96 = \$44$ .  
 $65 \times 8 = 520$ . B's "  $\frac{5}{9}$  of  $\$96 = \$52$ .  
 $\frac{5}{9}$
- 4  $\$2892 - \$964 = \$1928$ , sec. gain.  $\frac{2}{3} \times \frac{4}{5}$  of  $\$6000 = \$2000$  inv. 1.  
 $6000 - 2000 = \$4000$  inv. oth.
- 5  $\$2000 \times 12 = 24,000$ .  $\frac{2}{3}$ , or  $\frac{2}{3}$  of  $\$6045 = \$1612$  A's share.  
 $3000 \times 10 = 30,000$ .  $\frac{3}{5}$ , or  $\frac{1}{2}$  of  $\$6045 = \$2015$  B's share.  
 $4000 \times 9 = \frac{36,000}{90,000}$ .  $\frac{4}{5}$ , or  $\frac{2}{3}$  of  $\$6045 = \$2418$  C's share.
- 6  $3 + 4 + 6 = 13$  parts.  $\frac{1}{13}$  of  $\$195 = \$45$  share of first boy.  
 $\frac{4}{13}$  of  $\$195 = \$60$  " " second boy.  
 $\frac{6}{13}$  of  $\$195 = \$90$  " " third boy.
- 7  $1000 + 1500 + 1800 + 2000 + 2700 = 9000$  total indebtedness.  
 $\frac{1}{10}$ , or  $\frac{1}{10}$  of  $\$6000 = \$666.66\frac{2}{3}$  A's share.  
 $\frac{1}{10}$ , or  $\frac{1}{10}$  " =  $\$1000$  B's "  
 $\frac{1}{10}$ , or  $\frac{1}{10}$  " =  $\$1200$  C's "  
 $\frac{1}{10}$ , or  $\frac{1}{10}$  " =  $\$1333.33\frac{1}{3}$  D's "  
 $\frac{1}{10}$ , or  $\frac{1}{10}$  " =  $\$1800$  E's "



- 8  $5175 \div 6210 = 83\frac{1}{2}$  cts.  $1320 \times \$ .83\frac{1}{2} = \$1100$ .
- 9  $180 + 250 + 400 = 830$  tons.  $\frac{1}{3}$  of 249 = 54 tons, A's loss.  
 $\frac{2}{3}$  of " = 75 " B's "  
 $\frac{1}{3}$  of " = 120 " C's "
- 10 If A's = 1, then B's = 3, and C's = 2. Total 6 parts.  
 $\frac{1}{6}$  of \$786 = \$131 A's loss.  
 $\frac{3}{6}$  or  $\frac{1}{2}$  of \$786 = \$393 B's loss.  
 $\frac{2}{6}$  or  $\frac{1}{3}$  of \$786 = \$262 C's loss.
- 11  $\frac{1}{2} - (\frac{1}{2} + \frac{1}{4}) = \frac{1}{4}$  C's share.  
 $\frac{1}{2}$  of \$600 = \$300 A's gain.  $300 \times 12 = \$3600$  total capital  
 $\frac{1}{4}$  of \$3600 = \$900 A's investment  
 $\frac{1}{4}$  " \$3600 = \$900 B's "  
 $\frac{1}{4}$  " \$3600 = \$900 C's "
- 12  $3 \times 20 = 60$   $\$1000 - \$100 = \$900$ , am't to be divided  
 $5 \times 30 = \frac{150}{210}$   $\frac{1}{21}$ , or  $\frac{1}{7}$  of \$900 = \$257 $\frac{1}{7}$  + \$100 = \$357 $\frac{1}{7}$ , share of first.  
 $\frac{1}{7}$ , or  $\frac{1}{7}$  of \$900 = \$642 $\frac{1}{7}$  share of second.
- 13  $5316 \times .25 = \$1329$ , contract price.  $5 \times 45 \times 4 = \$900$  cost of teams.  $\$1329 - \$900 = \$429$  profit.  $\frac{2}{3}$  of \$429 = \$171.60, share of first.  $\frac{1}{3}$  of \$429 = \$257.40 share of second.
- 14  $3 + 4 + 5 = 12$  parts.  $\frac{3}{12}$ , or  $\frac{1}{4}$  of 1728 = 432  
 $\frac{4}{12}$ , or  $\frac{1}{3}$  of " = 576  
 $\frac{5}{12}$  of " = 720
- 15  $1200 \times \$1.10 = \$1320$  A's share.  $\frac{1}{3}$  of \$3090 = \$990 A's share  
 $800 \times 1.25 = 1000$  B's "  $\frac{1}{3}$  " " = \$750 B's "  
 $1600 \times 1.12\frac{1}{2} = \frac{1800}{\$4120}$  C's "  $\frac{1}{3}$  " " = \$1350 C's "

## PART III.

## PERCENTAGE

209 Page 182

- |    |  |    |  |
|----|--|----|--|
| 1  | $\$75 \div .03 = \$2500$                                     | 12 | $\$6.50 = \frac{1}{8}, \frac{1}{8} = 8 \times \$6.50 = \$52.$  |
| 2  | $\frac{1}{4}$ of $\$1728 = \$432$                            | 13 | $\frac{1}{4}$ of $\$1683.25 = \$673.30.$   |
| 3  | $\frac{1}{5} = \$750, \frac{1}{5} = 5 \times \$750 = \$3750$ | 14 | $\$150 = \frac{1}{3}, \frac{1}{3} = 3 \times \$150 = \$450.$   |
| 4  | $3200 \div 6400 = .20 = 20\%.$                               | 15 | $\$729.80 = \frac{1}{3}, \frac{1}{3} = \frac{1}{2}$ of $\$729.80$<br>$= \$364.90. \frac{1}{3} = 3 \times \$364.90 =$<br>$\$1094.70.$ |
| 5  | $\frac{2}{100}$ of $\$9900 = \$66.$                          | 16 | $2.50 \div 20 = .12\frac{1}{2} = 12\frac{1}{2}\%.$   |
| 6  | $\$75 \div \frac{1}{10} = \$4500.$                           | 17 | $.02\frac{1}{2} \times \$400 = \$10.$  |
| 7  | $25.92 \div \frac{1}{10} = \$1728.$                          | 18 | $.018 \times \$1500 = \$27.$   |
| 8  | $\$102.50 \div 20500 = .00\frac{1}{2} = \frac{1}{2}\%.$      | 19 | $13.50 \div 81 = .16\frac{2}{3} = 16\frac{2}{3}\%.$  |
| 9  | $\frac{1}{8}$ of $\$7288 = \$4555.$                          | 20 | $\$37.50$ is $6\%, 1\% = \frac{1}{6}$ of $\$37.50$<br>$= \$6.25. 100\% = 100 \times \$6.25$<br>$= \$625.$                            |
| 10 | $\frac{1}{4}$ of $\$36 = \$6.$                               |    |  |
| 11 | $490 \div 5000 = .09\frac{1}{2} = 9\frac{1}{2}\%.$           |    |  |

## PRACTICAL WORK IN PERCENTAGE

## 212 Page 183

- |  |   |
|--|---|
| <p>1 <math>\frac{1}{10}</math> of \$3300 = \$99.</p> <p>2 10%, or <math>\frac{1}{10}</math> of \$2500 = \$250, for board; 5%, or <math>\frac{1}{20}</math> of \$2500 = \$125, for clothing; 18% or <math>\frac{9}{50}</math> of \$2500 = \$450, for incidentals.</p> <p>3 40% = <math>\frac{2}{5}</math>. <math>\\$120 \div \frac{2}{5} = \\$300</math>.</p> <p>4 <math>870 \div 5800 = \frac{1}{7}</math>, = 15%.</p> | <p>5 <math>2\frac{1}{2} \div 20 = \frac{1}{8}</math>, = <math>\frac{1}{8}</math>, = 12<math>\frac{1}{2}</math>%.</p> <p>6 125% = <math>\frac{5}{4}</math>. <math>\\$6.25 \div \frac{5}{4} = \\$5</math>.</p> <p>7 <math>\\$36 \div .90 = \\$40</math>.</p> <p>8 <math>1250 \div 8750 = \frac{1}{7}</math> = 14<math>\frac{2}{7}</math>%.</p> <p>9 <math>\\$2150 \div .05\frac{1}{2} = \\$40,000</math>.</p> <p>10 37<math>\frac{1}{2}</math>% = <math>\frac{3}{8}</math>, <math>\frac{3}{8}</math> of \$2400 = \$900.</p> |
|--|---|

## 214 Page 185

- 1 \$35 S. P. 100% C. 40% gain. \$35 is 140% of  $35 \div 1.40 = \$25$
- 2 100% C. 37 $\frac{1}{2}$ % G. 137 $\frac{1}{2}$ % S. P. 137 $\frac{1}{2}$ % of \$7.20 =  $\frac{1}{4}$  of 7.25 = \$9.90.
- 3 \$3500 S. P. \$500 loss.  $\$3500 + \$500 = \$4000$ . 500 is what part of 4000?  $500 \div 4000 = \frac{1}{8} = 12\frac{1}{2}$ %.
- 4 100% C. - 16 $\frac{2}{3}$ % loss. = 83 $\frac{1}{3}$ % S. P.  $\$3.75 = 83\frac{1}{3}$ %, or  $\frac{5}{6}$ ;  $3.75 \div \frac{5}{6} = \$4.50$ .
- 5 \$3840 C. 100% C. - 2 $\frac{1}{2}$ % L. = 97 $\frac{1}{2}$ % S. P.  $3840 \times .02\frac{1}{2} = \$96$  loss.  $\$3840 - \$96 = \$3744$  S. P.
- 6 \$1 cost of 12 lbs. \$1.20 S. P. of 12 lbs., .20 G.  $.20 \div 1 = .20 = 20\%$ .

- 7 .50 S. P. - .37½ C. = 12½ G.  $.12\frac{1}{2} \div .37\frac{1}{2} = .33\frac{1}{3} = .33\frac{1}{3}\%$ .
- 8 1.05 S.P. 100% C. - 12½% L. = 87½%, or  $\frac{1}{4}$  S.P.  $1.05 \div \frac{1}{4} = \$1.20$ .
- 9 100% = C. 125% = marked price.  $\frac{1}{4}$  of 125% = 100% = S. P.  
Sold at cost, \$1.50.
- 10  $\frac{1}{4}$  cost of part sold.  $\frac{1}{4}$  selling price.  $\frac{1}{4}$  gain.  
Gain =  $\frac{1}{4}$  on  $\frac{1}{4} = \frac{1}{16} = 33\frac{1}{3}\%$ .
- 11 2240 lbs. - 2000 lbs. = 240 lbs. 240 lbs. gained on sale of  
2000 lbs. =  $240 \div 2000 = 12\%$ .
- 12 \$1 =  $\frac{1}{3}$  of cost.  $\$1 \div \frac{1}{3} = \$1.25$  C.  $\$1.25 \times 1.10 = \$1.37\frac{1}{2}$  S. P
- 13 \$7 = 14½%, or,  $\frac{1}{7}$  of cost.  $7 \times \$7 = \$49$  cost.  $\$49 - \$7 = \$42$  S. P
- 14 16½ cts. =  $\frac{1}{6}$ , 20% =  $\frac{1}{5}$ .  $\frac{1}{5}$  of  $\frac{1}{6} = 20$  cts.
- 15  $300 \div 12 = 25$  doz.  $\$1.50 \div 25 = \$.06$ .  $\$.06 \times 141\frac{1}{3}\% = 8\frac{1}{2}$  cts.
- 16 \$3.50 = 14%.  $3.50 \div .14 = \$25$  cost.  $2.75 \div 25 = .11 = 11\%$ .
- 17 10c. =  $\frac{1}{8}$  of cost.  $8 \times 10$  cts. = 80 cts. cost.
- 18 \$160 =  $\frac{1}{3}$ .  $\$160 \div \frac{1}{3} = \$180$  C. of second and S. P. of first.  
 $\$180 \div \frac{1}{2} = \$162$  C. of first.  $\$162 - \$160 = \$2$  loss.  
 $2 \div 162 = 1\frac{1}{81}\%$ .
- 19  $\$340 \div 12 = \$70$  cost per A.  $4 \times \$85 = \$340$  S. P. of first.  
 $3 \times \$75 = \$225$  " " second  
 $\frac{1}{3}$  of \$70 = \$60 S.P. per A. of third.  $5 \times \$60 = \$300$  " " third.  
\$865 total S. P.  
\$865 S. P. - \$340 C. = \$25 gain.  $25 \div 340 = 2\frac{1}{13}\%$ .

- 20  $\$35 = \frac{1}{3}$  of C. of first and  $\frac{1}{3}$  of cost of second.  
 $35 \div \frac{1}{3} = \$30$  C. of first.  $35 \div \frac{1}{3} = \$42$  cost of second.  
 $\$30 + \$42 = \$72$  cost.  $\$35 + \$35 = \$70$  S. P.  $\$72 - \$70 = \$2$  loss.  
 $2 \div 72 = 2\frac{1}{4}\%$ .
- 21  $\frac{1}{3}$  of 75c. = 90 cts.  $\frac{1}{3}$  of 95 cts. = \$1.14.  $\frac{1}{3}$  of \$1.10 = \$1.32.
- 22 55c. + 5c. = 60c. cost of each chair.  $\$.60 \times 120 = \$72$  total cost,  
 $\$96$  S. P. - \$72 C. = \$24 G.  $24 \div 72 = \frac{1}{3} = 33\frac{1}{3}\%$ .
- 23  $\frac{1}{3}$  leaked out.  $\$.08 \div \frac{1}{3} = \$.09$  S. P., equivalent to cost.  
 Gain  $\frac{1}{3}$ , S. P.  $\frac{1}{3}$  of \$.09 = 10 cts.
- 24  $7.82 \div .92 = \$8.50$  cost of  $\frac{1}{3}$ .  $\$8.50 \div \frac{1}{3} = \$21.25$  cost of whole c'sk  
 108% of \$21.25 = \$22.95.  $\$22.95 - 7.82 = \$15.13$  S. P. of rem.  $\frac{1}{3}$ .
- 25 100% C. + 10% G. = 110% assumed S. P.  $110\% - 95\% = 15\%$ .  
 $\$5.55 = 15\%$ , cost =  $\$5.55 \div .15 = \$37$ .
- 26  $\$65 - 37.50 = \$27.50$  cost of material. 110% of \$37.50 = 41.25  
 cost of labor.  $\$27.50 + \$41.25 = \$68.75$  total cost. 120% of  
 $\$68.75 = \$82.50$  S. P.
- 27  $1\frac{1}{2} \times \$1.06\frac{2}{3} = \$1.20$  S. P. per cental.  $240 \times \$1.20 = \$288$  S. P.  
 $240 \times .96 = 230.40$  C.  
 75% of 288 = \$216 am't really received.  $\$230.40$  C. - \$216  
 S. P. = \$14.40 L.  $\$14.40 \div \$230.40 = 6\frac{1}{4}\%$  loss.
- 28 Cost 3 for \$5 or \$20 per dozen.  $\$20 \times 3 = \$60$  C. + 10 G. =  
 $\$70$  S. P.  $\$70 \div 36 = \$1.94\frac{1}{2}$  av. S. P.  $\$10 \div \$60 = \frac{1}{6} = 16\frac{2}{3}\%$   
 gain.
- 29  $\$31.25 = \frac{1}{3}$  of C.  $\$31.25 \div \frac{1}{3} = \$37.50$  C.  $\$37.50 \div 25 = \$1.50$  C  
 per yard.
- 30 100 oranges - 5% loss = 95 oranges.  $95 \times \frac{1}{3}$  C. = \$.63 $\frac{1}{3}$  S. P.  
 $\$.63\frac{1}{3}$  S. P. - \$.40 C. = 23 $\frac{1}{3}$  cts. gain.  $23\frac{1}{3} \div 40 = 58\frac{1}{3}\%$ .

## LOSS AND GAIN

216 Page 189

- 1  $1500 \times .07\frac{1}{2} = 112.50$  loss.  $\$1500 - \$112.50 = 1387.50$  S. P.
- 2  $\$500 \div .02\frac{1}{2} = 20,000$  cost,  $+\$500 = \$20,500$  S. P.
- 3  $\$1320 \div .99 = \$1333\frac{1}{3}$  cost.  $\$1333\frac{1}{3} - \$1320 = \$13\frac{1}{3}$  loss.
- 4  $75 \div 2000 = 3\frac{3}{4}\%$ .  $\$2000 - \$75 = \$1925$  S. P.
- 5  $\$1085 \times 1.07\frac{1}{2} = \$1170.25$  S. P.,  $-\$1085$  C.  $= \$85.25$  gain.
- 6  $\$3050 - \$2375 = \$675$  gain  $\div \$2375 = 28\frac{1}{3}\%$ .
- 7  $\$147 \div .07 = \$2100$  C.,  $+\$147$  G.  $= \$2247$  S. P.
- 8  $\$2085 \div \frac{1}{2} = \$2502$  C.,  $-\$2085 = \$417$  loss.
- 9  $\$12.50 - \$10 = 2.50$  loss,  $\div \$12.50 = 20\%$  loss.
- 10  $\$18.50 \div 1\frac{1}{8} = \$19.73\frac{1}{2}$  cost,  $-\$18.50 = \$1.23\frac{1}{2}$  loss.
- 11  $\$45 \div .03\frac{1}{2} = \$1350$  C.,  $+\$45 = \$1395$  S. P.
- 12  $\$1300 \times 1.30 = 1690$  S. P.,  $-\$1300 = \$390$  gain.
- 13  $\$125 \times 6 = \$750$  C.  $-\$125 = \$625$  S. P.
- 14  $\$480 \div .73\frac{1}{2} = 654.\frac{1}{11}$  C.  $-\$480 = \$174.\frac{1}{11}$  loss.
- 15  $\$920 \times .85 = \$782$  S. P.  $\$920 - \$782 = \$138$  loss.
- 16  $\$840 \div .13\frac{1}{2} = \$6300$  C.,  $-\$840 = \$5460$  S. P.
- 17  $\$95.50 - \$5.50 = \$90$  C.  $\$5.50 \div \$90 = 6\frac{1}{3}\%$  G.

- 18  $\$200 - \$175 = \$25 \text{ G.}, \div \$175 = 14\frac{2}{3}\% \text{ G.}$
- 19  $\$7000 \times .14 = \$980 \text{ G.}, + \$7000 = \$7980 \text{ S. P.}$
- 20  $\$25.50 \times .50 = \$12.75 \text{ C.}, + \$25.50 = \$38.25 \text{ S. P.}$
- 21  $\$175 - \$150 = \$25 \text{ G.}, \div \$150 = 16\frac{2}{3}\%.$
- 22  $\$15 \times .80 = \$12 \text{ S. P.} \quad \$15 - \$12 = \$3 \text{ loss.}$
- 23  $\$15 \div .83\frac{1}{3} = \$18 \text{ C.}, - \$15 = \$3 \text{ loss.}$
- 24  $\$1030 \div 1.03 = \$1000 \text{ cost.}$

## COMMISSION

218 Page 190

- 1  $50 \times \$14 = \$700 \text{ S. P.}, \times .03 = \$21 \text{ com.} \quad \$700 - \$21 = \$679 \text{ net.}$
- 2  $\$10.50 + \$1.14 = \$11.64. \quad \$11.64 \times 50 = \$582 \text{ C.}$   
 $\$679 \text{ S. P.} - \$582 \text{ C.} = \$97 \text{ G.} \quad 97 \div 582 = 16\frac{2}{3}\%.$
- 3  $100 \times \$5.50 = \$550, \times 1.03 = \$566.50 \text{ B. price}$
- 4  $\$3120 \div 1.04 = \$3000 \text{ cost.} \quad \$3120 - \$3000 = \$120 \text{ com.}$
- 5  $\$3120 \times \$1.20 = \$3744 \text{ S. P.}, \div 750 = \$4.99\frac{1}{3} \text{ S. P. per bbl.}$
- 6  $6\frac{1}{4}\% \text{ of } 32 \text{ cts.} = 2 \text{ cts. com.} \quad 32 \text{ cts.} - 2 \text{ cts.} = \$30 \text{ cts. per doz.}$
- 7  $\$14000 + \$2700 + \$1300 = \$18,000 \text{ S. P.}, \times .01\frac{1}{2} = \$315 \text{ com.}$
- 8  $\$31500 \div 1.05 = \$30,000 \div 100 = 300 \text{ bales.}$

- 9  $\$2490 \div 1.03\frac{1}{2} = \$2400$ ,  $\times 1\frac{1}{2} = \$2905$  S. P.  
 $\$2400 \div \$.08 = 30,000$  lbs.  $\$2905 \div \$30,000 = \$.09\frac{1}{2}$  S. P. per lb.
- 10 35% of  $\$5 = \$1.75$ .  $\$1400 \div \$1.75 = 800$  vol.
- 11  $\$87.60 \div .03 = \$2920$ .
- 12  $3000 \times \$1\frac{1}{2} = \$3500$  S. P.  $\$3500 \times .02\frac{1}{2} = \$80$  com.  
 $\$3500 - \$80 = \$3420$  net.
- 13  $\$128.75 \div \$5150 = 2\frac{1}{2}\%$ .
- 14  $\$5115 - \$165 = \$4950$  B. P.  $\$165 \div \$4950 = 3\frac{1}{2}\%$ .
- 15  $\$123 \div .03 = \$4100$ .
- 16  $\$275 + \$1720 = \$1995$  cost.  $\$25 \times 12 = \$300$  rent.,  $\times .05 = \$15$  com.  
 $\$300 - \$15 = \$285$ .  $\$285 \div \$1995 = 14\frac{1}{2}\%$ .
- 17  $\frac{1}{2}$  of 5600 =  $\$4200$ ,  $\times .06\frac{1}{2} = \$262.50$  com.  
 $\$4200 - \$262.50 = \$3937.50$  proceeds.
- 18  $\$1890 \div .90 = \$2100$ .
- 19 5% of  $\$1.20 = \$.06$ .  $\$1.20 + \$.06 + \$01\frac{1}{2} = \$1.27\frac{1}{2}$  C.,  $\times 1.25 =$   
 $\$1.59\frac{1}{2}$  S. P.
- 20  $\$2689.75 \div 1.01\frac{1}{2} = \$2650$ .  $\$2650 \div .03\frac{1}{2} = 79,500$  lbs.
- 21  $\$25 \div .03\frac{1}{2} = \$750$ .  $\$750 \div .08\frac{1}{2} = 9000$  lbs.  $\$775 \div 9000 =$   
 $\$.08\frac{1}{4}$  per lb.
- 22  $\$5150 \div 1.03 = \$5000$ .  $\$5000 \div \$5 = 1000$  bbl.



- 23  $100 \times 480 = 48,000$  lbs.  $\div 100 = 480$  cwt.,  $\times \$18 = \$8640$ ,  $\times .05 = \$432$  com.
- 24  $450 \times \$13 = \$5850$ ,  $\times .05 = \$292.50$  com.  $\$5850 - \$292.50 = \$5557.50$ .  $\$5557.50 \div 1.04 = \$5343.75$  wool investment  $\$5557.50 - \$5343.75 = \$213.75$  com.  $\$5343.75 \div \$ .22\frac{1}{2} = 23,750$  lbs.  $\$292.50 + \$213.75 = \$506.25$  total com.
- 25  $500 \times \$2.50 = \$1250 + \$12 = \$1262$ .  $\$1287 - \$1262 = \$25$  com.  $\$25 \div \$1250 = 2\%$ .

## 220 Page 193

- 1  $\$165 \div \$6600 = 2\frac{1}{2}\%$  rate.  $\$6600 - \$165 = \$6435$  proceeds.
- 2  $\$140 \div .01\frac{1}{2} = \$8000$  C.
- 3  $\$5600 \div 1.025 = \$5463.41$  cost.  $\$5600 - \$5463.41 = \$136.59$  com.
- 4  $\$13.50 \div .01\frac{1}{2} = \$900$  S. P.  $\$900 - \$13.50 = \$886.50$  proceeds.
- 5  $\$8732 \times .02 = \$174.64$  com.  $\$8732 - \$174.64 = \$8557.36$  proceeds
- 6  $\$14.21 \div \$568.38 = 2\frac{1}{2}\%$  rate.
- 7  $\$420 \div \$14,000 = 3\%$  rate.
- 8  $\$2209 + \$141 = \$2350$  S. P.  $\$141 \div \$2350 = 6\%$  rate.
- 9  $\$4000 - \$250 = \$3750$ .  $\$250 \div \$3750 = 6\frac{2}{3}\%$  rate.
- 10  $\$2182.80 \div 1.02 = \$2140$  C.  $\$2182.80 - \$2140 = \$42.80$  com.
- 11  $\$4872 - \$4800 = \$72$  com.  $\$72 \div \$4800 = 1\frac{1}{2}\%$  rate.
- 12  $\$48.29 \div .02\frac{1}{2} = \$1756$  S. P.

$$13 \quad \$1500 - \$41.12 = \$1458.88. \quad \$41.12 \div \$1458.88 = 2\frac{1}{2}\%.$$

$$14 \quad \$4975 + \$25 = \$5000 \text{ S. P.} \quad \$25 \div \$5000 = \frac{1}{2}\%.$$

$$15 \quad \$74.25 \div .06\frac{1}{2} = \$1188 \text{ cost.}$$

$$16 \quad \$2000 \times .00\frac{1}{4} = \$5 \text{ com.}$$

## INSURANCE

222 Page 195.

$$1 \quad \$5500 \times .00\frac{1}{2} = \$44 \text{ premium.} \quad \$5500 - \$44 = \$5466 \text{ loss.}$$

$$2 \quad \$110 \div .02\frac{1}{4} = \$4000 \text{ value.}$$

$$3 \quad 360 \div 48,000 = .0075 = \frac{3}{4}\%.$$

$$4 \quad \$4000 \div 2 = \$2000, \times .01 = \$20 \text{ premium.} \quad \$2000 - \$20 = \$1980.$$

$$5 \quad \$62.50 \div .025 = \$2500. \quad \$2500 = \frac{2}{3}, \frac{1}{3} = \frac{1}{3} \text{ of } \$2500 = \$3750.$$

$$6 \quad \$3600 - \$3528 = \$72 \text{ com.} \quad \$72 \div \$3600 = 2\%.$$

$$7 \quad \$7600 \div 1.01\frac{1}{3} = \$7500 \text{ insurance.} \quad \$7600 - \$7500 = \$100 \text{ prem.}$$

$$8 \quad \$6000 + \$1800 + \$1200 = \$9000, \times \frac{2}{3} = \$6000.$$

$$\$106 - \$1 = \$105, \div 6000 = 1\frac{1}{4}\%.$$

$$9 \quad \$6500 + \$500 = \$7000, \times \frac{5}{7} = \$5000. \quad \frac{1}{7}\% \text{ of } \$5000 = \$37.50.$$

$$\$7000 + \$37.50 = \$7037.50 \text{ total cost.} \quad \$7037.50 \times .96 = \$6756.$$

$$10 \quad \$2846.25 \div 1.035 = \$2749.951 \text{ am't invested, } \div \$5\frac{1}{2} = 500 \text{ bbl.}$$

$$1\frac{1}{4}\% \text{ of } \$2746.95 = \$34.374 \text{ ins., } + \$2846.25 = \$2880.624 \text{ total C.}$$

$$10\% \text{ of } \$2880.624 = \$288.0624 \text{ gain} + \$2880.624 \text{ cost} =$$

$$\$3168.68 \text{ S. P., } \div 500 = \$6.337 +.$$

- 11  $\$30 \div \$2400 = \frac{1}{80} = 1\frac{1}{8}\%$ .
- 12  $\$1500 \times \frac{1}{4}\% = \$11.25 \times 2 = \$22.50$  first cost.  
 $\$3200 \times \frac{1}{4}\% = \$28$  2d cost.  $\$28 - \$22.50 = \$5.50$  favor of first.
- 13  $3\% \times 3 = 9\%$ .  $9\%$  of  $2400 = \$216$ .  $\$2400 - \$216 = \$2184$  loss.  
 [Not strictly true, as company had use of premium at ruling interest rates, which lessens the loss considerably.]
- 14  $\pounds 1500 \times \frac{1}{4}\% = \pounds 12$ ,  $\times \$4.86 = \$58.32$ .
- 15  $\$2562 - \$42 = \$2520$ .  $42 \div 2520 = 1\frac{1}{6}\%$ .
- 16  $\$19.80 \times 8 = \$158.40$  annual payment,  $\times 20 = \$3168$ .
- 17 [6 $\frac{1}{2}\%$  should read 6 $\frac{3}{4}\%$ ]  $6\frac{3}{4}\% \div .01\frac{1}{2} = \$500$ .
- 18  $\$10.50 \div .0175 = \$600 \div \frac{1}{2} = \$900$  cost.  
 $\$900 \times 1.16\frac{2}{3} = \$1050$ ,  $\div 200 = \$5.25$  per bbl.
- 19  $\$2100 \times .008 = \$16.80$  premium +  $\$2100 = \$2116.80$ .
- 20  $\$6000$  cost +  $\$75$  insurance +  $\$900$  repairs =  $\$6975$  total cost.  
 $\$6975 + (\frac{1}{3} \text{ of } \$6975) = \$9300$  S. P. house.  
 $\$9300 \div 1.03\frac{1}{2} = \$9000 \div \frac{1}{4} = 2000$  bbl.  
 $2000 \text{ bbl.} \times \$4 = \$8000$  S. P., -  $(3\frac{1}{8}\% \text{ of } \$8000) = \$7750$  received.  
 $\$7750 - \$6975 = \$775$  gain.  $775 \div 6975 = 11\frac{1}{8}\%$ .

## TAXES

225 Page 198

- 1  $1200 \times \$1.50 =$  poll tax.  $\$21800 - \$1200 = \$20,000$ .  
 $20,000 \div 4,000,000 = \frac{1}{200} = \frac{1}{2}\%$ .
- 2  $\$4000 + \$1800 = \$5800 \times \frac{1}{2}\% = \$29$  property tax.  
 $\$29 + \$1.50 = \$30.50$ .

- 3  $\$16 - \$1.50 = \$14.50$  property tax.  $\$14.50 \div .005 = \$2900.$
- 4  $\$5500 + \$1700 = \$7200 \times .005 = \$36$  property tax.  
 $\$36 + (3 \times \$1.50) = \$40.50.$
- 5  $\$4500 \div \$1,000,000 = .0045 = 45$  cts. on the hundred.
- 6  $\$8500 - \$500 = \$8000.$   $\$8000 \div .016 = \$500,000.$
- 7  $\$3000 \div .003 = \$1,000,000.$   $\frac{3}{10}\% = 3$  mills on the dollar.
- 8  $\$3500 \times .00\frac{1}{2} = \$7.$
- 9  $\$4750 \div .95 = \$5000$  tax.  $\$5000 \times \$450,000 = 1\frac{1}{2}\%.$
- 10  $\$7500 + \$2750 = \$10,250.$   $\$10,250 \times .008 = \$82$  property tax.  
 $\$82 + (2 \times \$2 \text{ poll tax}) = \$86.$
- 11  $485 \times \$2 = \$970$  poll tax - (10% of \$970) = \$873.
- 12  $\frac{3}{4}$  of \$2000 = \$1500  $\times .008 = \$12$  insurance.  
 $\frac{3}{4}$  of 2400 = \$1600  $\times .014 = \$22.40$  tax. 20% of \$2400 = \$480.  
 $\$480 + \$12 + \$22.40 = \$514.40 \div 12 = \$42.86\frac{2}{3}$  per month.
- 13  $\$2850 \div .95 = \$3000.$  tax.  $\$3000 \div .005 = \$600,000.$
- 14  $\$77.50 \times 12 = \$930$  yearly rent.  
 $\frac{3}{4}$  of 7000 = \$5000  $\times .0075 = \$37.50$  insurance.  
 $\frac{1}{4}$  of \$7000 = \$5250  $\times .01 = \$52.50$  taxes.  
 $\$37.50 + \$52.50 = \$90$  total expenses.  
 $\$930 - \$90 = \$840$  true income.  $840 \div 7000 = 12\%.$

## DUTIES

227 Page 200

- 1  $100 \times \$ .25 = \$25$  on oranges.  $60 \times \$ .30 = \$18$  on lemons.  
 $\$25 + \$18 = \$43$  duty.
- 2  $100 \times \$15 = \$1500 \times .25 = \$375.$
- 3  $11 \times 2240 \text{ lb.} = 24640 \text{ lb.}, \times .009 = \$221.76$
- 4  $12 \times 225 \text{ lb.} = 3060 \text{ lb.} \times \$ .80 = \$2448$  original cost.  
 $3060 \text{ lb.} \times \$ .35 = \$1071$  duty.  $\$2448 \times .35 = \$856.80$  ad val.  
 $\$2448$  cost +  $\$1071$  duty +  $\$856.80$  ad val. +  $\$72.50$  charges =  
 $\$4448.30$  total cost.
- |   |     |               |   |          |           |
|---|-----|---------------|---|----------|-----------|
| 5 | 80  | $\times \$7.$ | = | \$560    | champagne |
|   | 90  | $\times 2.$   | = | 180      | brandy    |
|   | 94½ | $\times .50$  | = | 47.25    | wine      |
|   | 75  | $\times .35$  | = | 26.25    | ale       |
|   |     |               |   | <hr/>    |           |
|   |     |               |   | \$818.50 | total     |
- 6  $\$2283.60 \div .60 = \$3806.$
- 7  $1280 \text{ yd.} \times \$ .30 = \$384$  duty on carpet.  
 $1440 \text{ " } \times .20 = 288$  duty on tapestry.  
 $\$725 \text{ " } \times .30 = 217.50$  ad. val. on carpet.  
 $\$650 \text{ " } \times .30 = 195$  ad. val. on tapestry.  
 $\$1084.50$  Total.
- 8  $840 \text{ lb.} \div 56 \text{ lb.} \times \$ .20 = \$3.$
- 9  $1000 \text{ T.} \times \$ .75 = \$750.$
- 10  $200 \text{ T.} \times 20 \times .08 = \$320.$

$$11 \quad 50 \times 108 \text{ lb.} = 5400 \text{ lb.} \times \$0.01 = \$54.$$

$$12 \quad \$94 \times .20 = \$18.80.$$

$$13 \quad 200 \times \$0.45 = \$90 \times \$0.20 = \$18.$$

## STOCKS

228 Page 202

$$2 \quad \$1000 \times .00\frac{1}{2} = \$2.50 \text{ brokerage} + \$1020 = \$1022.50.$$

$$3 \quad \$1000 \times .04 = \$40 \text{ dividend. } \$40 \div \$1022.50 = 3\frac{1}{2}\frac{1}{2}\%.$$

$$4 \quad \$320 \div .04 = \$8000 \text{ of stock} = 80 \text{ shares. } \$102 \times 80 = \$8160.$$

$$5 \quad \$720 \div .09 = \$8000 \text{ of stock} = 80 \text{ shares. } 80 \times \$60 = \$4800.$$

$$6 \quad .07 \div 1.4525 = 4\frac{1}{2}\%.$$

$$7 \quad .12 \div 1.6925 = 7\frac{1}{2}\frac{1}{2}\% \text{ B. of Cal. } .09 \div 1.25 = 7\frac{1}{2} \text{ F. N.}$$

$$8 \quad \$99\frac{1}{2} - \$82 = \$17\frac{1}{2}. \quad \$2860 \div \$17\frac{1}{2} = 160 \text{ shares.}$$

$$160 \times \$82 = \$13,120.$$

$$9 \quad 17\frac{1}{2} \div 82 = 21.8 - \%.$$

$$10 \quad \$4000 \times .00\frac{1}{2} \times \$25 \text{ taxes. } \$275 - \$25 = \$250 \text{ income. } 250 \div$$

$$5000 = 5\% \text{ house. } \$5000 \times 1.12 = \$5600. \quad \$5600 \div .70 = \$8000$$

$$\text{of stock. } \$8000 \times .03\frac{1}{2} = \$280 \text{ income. } 280 \div 5600 = 5\% \text{ stock.}$$

$$11 \quad \$1468 \div \$91.75 = 16 \text{ shares.}$$

$$12 \quad 150 \times \$2.50 = \$375. \quad \$375 \times .00\frac{1}{2} = 1.87\frac{1}{2} \text{ com.}$$

$$\$375 + \$187\frac{1}{2} = \$376.87\frac{1}{2}.$$

13  $.99 \times .11\frac{1}{2} = 11\%$ .

14  $50 \times \$2.50 = \$125$ .  $100 \times \$1\frac{1}{2} = \$125$ .  $\$250 \times .00\frac{1}{2} = \$1.25$  com.  
 $\$250 + \$1.25 = \$251.25$ .

15  $109\frac{1}{2} - \$101 = \$8.50$  loss on each share.  $\$340 \div \$8.50 = 40$  sh's.

16  $\$570 \div \$6 = 95$  shares.  $95 \times \$66.50 = \$6317.50$ .

17  $.05 \div .87\frac{1}{2} = 5\frac{1}{2}\frac{1}{2}\%$  S. P. R. R.  $.06 \div .99 = 6\frac{1}{3}\%$  O. N.

18  $24 \times \$53.50 = \$1234$ .  $\$1284 \div \$107 = 12$  shares.

19  $\$1182.50 \div \$118\frac{1}{2} = 10$  shares.

---

## INTEREST

231 Page 207

	Time			Interest	Interest	Amount
	yr.	mo.	da.	on \$1.	on Principal	
1	1	1	8	\$.006 $\frac{1}{2}$	\$ 11.9068	\$ 191.41
2	2	11	6	.176	57.20	382.20
3	3	2	16	.192 $\frac{3}{4}$	146.1858	904.94
4	2	3	22	.138 $\frac{3}{4}$	142.0293	1166.28
5		2	14	.012 $\frac{1}{2}$	7.2088	591.71
6	1	3	11	.076 $\frac{1}{2}$	55.7687	781.61
7	3	6	24	.214	83.0213	470.97
8			24	.004	.1688	42.87

## 232 Page 207

	Time			Interest	Interest
	yr.	mo.	da.	on \$1.	on Prin.
				.01 $\frac{1}{2}$	\$ 6.00
				.01 $\frac{3}{4}$	7.50
1	0	3	0	.02	9.00
2	2	3	0	.11 $\frac{1}{2}$	43.53 $\frac{1}{2}$
				.15 $\frac{1}{2}$	60.95 $\frac{1}{2}$
				.18	69.66
3	2	0	0	.08	57.46
4	3	3	10	.22 $\frac{1}{2}$	94.07 $\frac{1}{2}$
5	3	20	0	.15 $\frac{1}{2}$	109.694
6	2	2	25	.156 $\frac{1}{2}$	59.48
7	2	5	17	.049 $\frac{5}{8}$	83.772
8	0	2	14	.012 $\frac{1}{2}$	11.229
9		4	21	.019 $\frac{7}{8}$	14.648
10		5	24	.019 $\frac{3}{4}$	16.916
11	1	0	9	.071 $\frac{1}{4}$	180.236
12		6	0	.04	154.

## PROBLEMS IN INTEREST

## 238 Page 212

- 1  $\$360 \times .06 = \$21.60$  int. for 1 year.  $\$97.20 \div \$21.60 = 4\frac{1}{2}$  yr. =  
4 years 6 months.



- 2  $\$900 \times .07 = \$63$  int. for 1 yr.  $\$84 \div \$63 = 1\frac{1}{3}$  yr. = 1 yr. 4 mo.  
 $\$900 \times .08 = \$72$  " "  $\$84 \div \$72 = 1\frac{1}{3}$  yr. = 1 yr. 2 mo.
- 3  $\$1$  @ 5% for 2 yr. 6 mo. = \$.125 int.  $\$62.50 \div \$.125 = \$500$ .
- 4  $\$145$  @ 1% for  $\frac{1}{2}$  yr. = \$.725 int.  $\$5.80 \div \$.725 = 8$ ; or 8%
- 5  $\$240$  @ 1% for given time = \$.840 int.  $\$56 \div \$.840 = 6\frac{2}{3}$ ; or  $6\frac{2}{3}\%$ .
- 6  $\$1$  @ 7% " " =  $\$1.23\frac{1}{2}$  amt.  $\$296 \div \$1.23\frac{1}{2} = \$240$ .
- 7  $\$1$  @ 6% " " =  $\$1.03$  "  $\$700 \div \$1.03 = \$679.61$
- 8  $\$720$  @  $1\frac{1}{2}\%$  for one month =  $\$10.80$  int.  
 $\$16.20 \div \$10.80 = 1\frac{1}{2}$  mo. = 1 mo. 15 da.
- 9  $\$1$  @  $\frac{1}{2}\%$  per mo. for given time =  $\$1.02$  amt.  
 $\$400 \div \$1.02 = \$392.16$ .
- 10  $\$1$  @ 6% for given time =  $\$1.03$  amt.  
 $\$390 \div \$1.03 = \$378.64$  P.W.  $\$390 - 378.64 = \$11.36$  disc.
- 11  $\$1$  @ 8% for given time =  $\$1.04$  amt.  
 $\$104 \div \$1.04 = \$100$  P. W.  $\therefore$  No diff.
- 12  $\$700 \times .08 = \$56$  int.  $\$450 \times .08 = \$36$  int. 1 yr.  
 $\$56 \div \$36 = 1$  yr. 6 mo. 20 da.
- 13  $\$250 \times 1.04 = \$240.38$  P. W.  
 $\$250 \div 1.06 = 235.85$  P. W.  
 $\$250 \div 1.09 = \underline{229.36}$  P. W.  $\$705.59$  total P. W.
- 14  $\$7500 \div 1.02 = \$7352.94$  P. W.; or cost.  
 $\$7500$  S. P. -  $\$7352.94 = \$147.06$  gain.

- 15  $\$35 \times 12 = \$420$  annual income.  $\$420 \div \$3400 = 12\frac{1}{2}\%$ .
- 16  $\$275$  @ 1% for given time =  $\$9.35$  int.  $\$56.10 \div 9.35 = 6$ ; or 6%.
- 17  $\$1$  @  $7\frac{1}{2}\%$  for given time =  $.240\frac{1}{2}$  int.  
 $\$103.95 \div .240325 = \$432$  prin.
- 18  $\$1$  @ 6% for given time =  $.005$  int.  $\$100 \div .005 = \$20,000$  prin.
- 19  $\$1$  @ 6% for given time =  $1.2185$  amt.  
 $\$926.06 \div \$1.2185 = \$760$  prin.
- 20 (Same as example 8.)
- 21  $\$125 \times .04 = \$5$  int. 1 yr.  $\$16.50 \div \$5 = 3$  yr. 3 mo. 18 da.
- 22  $\$760$  @ 1% for given time =  $\$27.67\frac{2}{3}$  int.  
 $\$166.06 \div 27.67\frac{2}{3} = 6$ ; or 6%.
- 23  $\$1$  @ 6% for 2 mo. 9 da. =  $\$1.0115$  amt.  
 $\$221.27 \div \$1.0115 = \$218.75$ .
- 24  $\$1$  for given time @ 8% =  $.02$  int.  $\$125 \div .02 = \$6250$ .
- 25  $\$1$  for given time @ 6% =  $\$1.1575$  am't.  
 $\$560.23 \div \$1.1575 = \$484$ .
- 26  $\$90 \times .07 = \$6.30$  int. 1 yr.  $\$10 \div \$6.30 = 1$  yr. 7 mo. 2 da. =  
 Jan. 3, 1882.
- 27  $\$460 \times .05 = \$23$  int. 1 yr.  $\$71.30 \div \$23 = 3$  yr. 1 mo. 6 da.
- 28  $\$200 \div 1.01 = \$198.01$ .  
 $300 \div 1.015 = 295.56$ .  
 $400 \div 1.02 = 392.15$ .  
 $\$885.72$  total P. W.

29  $\$210 \div 1.04 = \$201.92$  P. W.; or S. P.  $\$201.92 - \$200 = \$1.92$  G.

30  $\$410 @ 1\%$  for given time =  $\$4.51$  int.  $\$27.06 \div \$4.51 = 6$ ; or  $6\%$ .

31  $\$210 \div \$.28$  (int. on  $\$1$ ) =  $\$750$  prin.

32  $\$550 \times .06 = \$33$  int. 1 yr.  $\$102 \div \$33 = 3$  yr. 1 mo. 3 da.

33  $\$270 \times .06 = \$16.20$  interest.  $\$270 \div 1.06 = \$254.717$  P. W.  
 $\$270 - \$254.717 = \$15.283$  discount.  $\$16.20$  interest -  $\$15.283$   
discount =  $\$.917$  difference.

34  $7\frac{1}{2}\% - 6\% = 1\frac{1}{2}\%$  gain per year.  $\$35.10 \div .045 = \$780$  principal.

35  $\$75 @ 1\%$  for 4 mo. =  $\$.25$  int.  $\$2.00 \div \$.25 = 8$ ; or  $8\%$ .

36  $\$1000 \div 1.01 = \$990.09$  P. W.

$500 \div 1.025 = 487.80$  P. W.

$500 \div 1.015 = 492.61$  P. W.

$\$1970.50$  total P. W.

## PARTIAL PAYMENTS

240 Page 215

1  $\$1500$  prin.

$54$  int.

$1554$  amt.

$500$  pymt.

$1054$  new prin.

$21.08$  int.

$1075.08$  amt.

$500$  2d pymt.

$575.08$  new prin.

$2.30$  int.

$\$577.38$  balance due.

2

$\$480$  prin.

$16.80$  int.

$496.80$  amt.

$196.80$  pymt.

$300$  N. prin.

$10.50$  int.

$310.50$  amt.

$214$  2nd pymt.

$96.50$  N. prin.

$3.37$  int.

$\$99.87$  bal. due

3      \$1000   prin.  
          50    int.  
         1050   amt.  
          50    pymt.  
         1000   N. prin.  
          26.60 int.  
         1026.60 amt.  
          450   2nd pymt.  
         \$ 576.60 bal. due

4      \$1230   prin.  
          11.265 int. 2m. (.009 $\frac{1}{4}$ )  
         1241.275 amt.  
          98    1st pymt.  
         1143.275 N. prin.  
          16.768 int. 3m6d(.014 $\frac{1}{2}$ )  
         1160.043 amt.  
          500   2nd pymt.  
         660.043 N. prin.  
          10.386 I. 3m13d(.015 $\frac{1}{4}$ )  
         670.429 amt.  
          290   3rd pymt.  
         380.429 N. prin.  
          4.649 I. 2m 20d (.012 $\frac{1}{2}$ )  
         385.078 amt.  
          100   4th pymt.  
         285.078 N. prin.  
          .914 I. 21 da. (.003 $\frac{1}{4}$ )  
         \$285.992 balance due.

5      \$800 prin.  
          35.333 I. 5m. 9d(.044 $\frac{1}{4}$ )  
         835.333 amt.  
          200   1st pymt.  
         635.333 N. prin.  
          3.706 I. 21 da. (.005 $\frac{1}{2}$ )  
         639.039 amt.  
          50    2d pymt.  
         589.039 N. prin.  
          19.62 I. 4 mo. (.033 $\frac{1}{2}$ )  
         608.659  
          15.   3d pymt.  
         593.659 N. prin.  
          9.894 I. 2 mo. (.016 $\frac{1}{2}$ )  
         \$603.553 balance due.

6      \$365 prin.  
          3.65 I. 2 mo. (.01)  
         368.65 amt.  
          68.65 1st pymt.  
         300   N. prin.  
          3.40 I. 2m. 8d. (.011 $\frac{1}{4}$ )  
         303.40 amt.  
          103.40 2d pymt.  
         \$200   balance due.

7 \$2500 prin.  
     70.972 int.  


---

 2570.972 amt.  
     500 1st pymt.  


---

 2070.972 N. prin.  
     27.89 int.  


---

 2098.862 amt.  
     750 2d pymt.  


---

 1348.862 new prin.  
     38.02 int.  


---

 \$1386.882 balance due.

9 \$500 prin.  
     3.33 $\frac{1}{2}$  int. 1 mo. (.00 $\frac{1}{2}$ )  


---

 \$503.33 amt.  
     100 1st pymt.  


---

 403.33 N. prin.  
     2.69 int. 1 mo. (.00 $\frac{1}{2}$ )  


---

 406.02 amt.  
     100 2d pymt.  


---

 306.02 N. prin.  
     2.04 int. 1 mo. (.00 $\frac{1}{2}$ )  


---

 308.06 amt.  
     100 3d pymt.  


---

 208.06 N. prin.  
     1.378 int. 1 mo. (.00 $\frac{1}{2}$ )  


---

 \$209.447 balance due.

8 \$960 prin.  
     13.20 I. 2 m. 6d. (.013 $\frac{1}{2}$ )  
     18.00 I. 3 mo. (.018 $\frac{1}{2}$ )  


---

 991.20 amt.  
     370 1st and 2d pymts  


---

 621.20 N. prin.  
     3.8825 I. 1 mo. (.006 $\frac{1}{2}$ )  


---

 625.08 amt.  
     300 3d pymt  


---

 \$325.08 balance due.

10 \$1200 prin.  
     17 I. 2 m. 25 d. (.014 $\frac{1}{2}$ )  


---

 1217 amt.  
     500 1st pymt.  


---

 717 N. prin.  
     9.6795 I. 2 m 21 d. (.013 $\frac{1}{2}$ )  


---

 726.68 amt  
     500 2d pymt.  


---

 226.68 N. prin.  
     2.266 int. 2 mo. (.01)  


---

 \$228.946 balance due.

## COMPOUND INTEREST

242 Page 217

## 1 \$1000 prin.

1.06
<hr/>
1060 amt. 1 yr.
1.06
<hr/>
1123.60 amt. 2 yrs.
1.06
<hr/>
1191.016 amt. 3 yrs.
1.06
<hr/>
1262.4769 amt. 4 yrs.
1000
<hr/>
262.48 comp. int.

## 2 \$300

1.04
<hr/>
312 amt. 6 mo.
1.04
<hr/>
324.48 amt. 1 yr.
1.04
<hr/>
337.46 amt. 1 yr. 6 mo.
1.00 $\frac{1}{2}$
<hr/>
339.709 amt. 1 yr. 7 mo.
300
<hr/>
\$39.709 comp. int.

## 3 \$425

1.01
<hr/>
429.25 amt. 3 mo.
1.01
<hr/>
433.542 amt. 6 mo.
1.01
<hr/>
437.87 amt. 9 mo.
1.00 $\frac{3}{4}$
<hr/>
440.789 amt. 11 mo.
425
<hr/>
\$15.80 comp. int.

## 4 \$250

1.02 $\frac{1}{2}$
<hr/>
256.25 amt. 6 mo.
1.02 $\frac{1}{2}$
<hr/>
262.66 amt. 1 yr.
1.00 $\frac{5}{8}$
<hr/>
263.75 amt. 1 yr. 1 mo.
250
<hr/>
13.75 comp. int.

5	\$500		8	\$275
	<u>1.06</u>			<u>1.01½</u>
	530 amt. 1 yr.			279.125 amt. 3 mo.
	<u>1.06</u>			<u>1.01½</u>
	361.81 amt. 2 yrs.			283.31 amt. 6 mo.
	<u>1.01½</u>			<u>1.01½</u>
	570.227 amt. 2 yr. 3 mo.			287.559 amt. 9 mo.
	<u>500</u>			<u>275.</u>
	\$70.23 comp. int.			\$12.56 comp. int.
6	\$490		9	\$800
	<u>1.02</u>			<u>1.06</u>
	499.80 amt. 3 mo.			848 amt. 1 yr.
	<u>1.02</u>			<u>1.06</u>
	509.796 amt. 6 mo.			898.88 amt. 2 yr.
	<u>1.01½</u>			<u>1.02</u>
	516.60 amt. 8 mo.			916.857 amt. 2½ yr.
	<u>490</u>			<u>800</u>
	\$26.60 comp. int.			\$116.86 comp. int.
7	\$1500		10	\$1200
	<u>1.03½</u>			<u>1.03</u>
	1552.50 amt. 6 mo.			1236 amt. 6 mo.
	<u>1.01½</u>			<u>1.03</u>
	1573.33 amt. 8 mo. 9 da.			1273.08 amt. 1 yr.
	<u>1500</u>			<u>1.03</u>
	\$73.33 comp. int.			1311.27 amt. 1 yr. 6 mo.
				<u>1.001</u>
				1312.58 A. 1 y. 6 mo. 6 d.
				<u>1200</u>
				\$112.58 comp. in

## DISCOUNT

243 Page 218

- 1 Discounted 2 mo.  $\$700 \times .01\frac{1}{2} = \$9.33\frac{1}{2}$  discount.  
 $\$700 - \$9.33\frac{1}{2} = \$690.67$  proceeds.
- 2 Discounted 32 da.  $\$850 \times .01\frac{1}{5} = \$9.06\frac{2}{3}$  discount.  
 $\$850 - \$9.06\frac{2}{3} = \$840.93$  proceeds.
- 3  $\$1400 \times 1.04 = \$1456$  amt. of note. Discounted 3 mo.  
 $\$1456 \times .02 = \$29.12$  dis.  $\$1456 - \$29.12 = \$1426.88$  proceeds.
- 4  $\$900 \times 1.03 = \$927$  amt. of note.  $\$927 \times .02 = \$18.54$  discount.  
 $\$927 - \$18.54 = \$908.46$  proceeds.
- 5  $\$250 \times .01 = \$2.50$  discount.  $\$250 - \$2.50 = \$247.50$  proceeds.
- 6 Discounted 23 da.  $\$1850 \times .00\frac{2}{3} = \$14.18$  discount  
 $\$1850 - \$14.18 = \$1835.82$  proceeds.
- 7  $\$525 \times 1.02 = \$535.50$  amount of note. Discounted 3 months.  
 $\$535.50 \times .03 = \$16.065$  discount.  $\$535.50 - \$16.065 = \$519.435$ .
- 8  $\$300 \times 1.04\frac{1}{2} = \$313.50$  amt. of note. Discounted  $3\frac{1}{2}$  mos.  
 $\$313.50 \times .05 = \$15.675$  discount.  $\$313.50 - \$15.675 = \$297.83$ .
- 9  $\$1140 \times 1.08 = \$1231.20$  amt. of note. Discounted  $10\frac{2}{3}$  mos.  
 $\$1231.20 \times .07\frac{1}{5} = \$89.467$  discount.  
 $\$1231.20 - \$89.467 = \$1141.73$  proceeds.
- 10 Discounted  $2\frac{1}{5}$  mos.  $\$1375 \times .01\frac{1}{5} = \$24.44$  discount  
 $\$1375 - \$24.44 = \$1350.56$  proceeds.
- 11  $\$735 \times 1.025 = \$753.375$  amt. of note. Discounted 48 days.  
 $\$753.375 \times .032 = \$24.108$  dis.  $\$753.375 - \$24.108 = \$729.267$ .



## COMMERCIAL DISCOUNT

244 Page 220

- 1  $\$450 \times .60 = \$270 \times .95 = \$256.50$  ans.
- 2  $.75 \times .95 = .71\frac{1}{4}$ .  $\$1.00 - .71\frac{1}{4} = .28\frac{3}{4}$ ; or,  $28\frac{3}{4}\%$  discount.
- 3  $\$250 \times .65 = \$162.50$ , at 35% dis.  $\$250 \times .30 = \$175 \times .95 = \$166.25$ , at 30 and 5 dis.  $\$166.25 - \$162.50 = \$3.75$  more.
- 4  $\$810 \div .90 = \$900 \div .90 = \$1000$  ans.
- 5  $\$200 \times .95 = \$190$ .
- 6  $\$830 \times .70 = \$581 \times .90 = \$522.90 \times .95 = \$496.75$  cost.  
 $\$496.75 \times 1.20 = \$596.10$  S. P.
- 7  $\$76 \div .95 = \$80$  invoice price.
- 8  $\$425.50 \times .90 = \$382.95 \times .95 = \$363.80$  cash value.
- 9  $\$725 \times .97 = \$703.25$  cash value.
- 10  $\$5.50 \times .90 = \$4.95 \times .90 = \$4.45$  price paid.
- 11  $\$1.50 \div .83\frac{1}{3} = \$1.80 \div .75 = \$2.40$  list price.
- 12  $\$700 \times .85 = \$595 \times .96 = \$571.20$  amt. received.

## EXCHANGE

245 Page 230

- 1  $\$5000 \times 1.015 = \$5075$  cost of sight draft.  
 $\$5075 \times .98\frac{2}{3} = \$5008.33\frac{1}{3}$ .

- 2  $\$580 \times .99\frac{1}{2} = \$577.10.$
- 3  $2481.25 \div .99\frac{1}{2} = \$2500.$
- 4  $320 \times \$4.95 = \$1584$  cost of sight draft.  $\$1584 \times .98\frac{1}{2} = \$1565.52.$
- 5  $\$1566.15 \div .985 = \$1589.94.$
- 6  $\$1 + .015$  premium -  $.015$  int. allowance =  $\$1.$  cost =  $\$4500.$
- 7  $4000 \times .186 = \$744 \times .99 = \$736.56.$
- 8  $\$800 - \$794 = \$6$  discount.  $6 \div 800 = \frac{3}{4}\%.$
- 9  $\$765 \times 1.00\frac{1}{2} = \$770.7375$  cost of sight draft.  
 $\$770.7375 \times .99\frac{1}{2} = \$769.04.$
- 10  $\$799.60 \div .9945 = \$804.022$  cost of  $\$800$  sight draft.  
 $\$4.022$  premium  $\div \$800 = \frac{1}{2} + \%.$
- 11  $1000 \times .186 = \$186.$   $\$1 + .015$  premium -  $.015$  int. allowance =  
 $\$1 \therefore$  Cost =  $\$186.$
- 12  $\$162.75 = 875$  fr.  $\$1 + .015$  premium -  $.015$  int. allowance =  
 $\$1 \therefore$  Draft =  $875$  fr.
- 13  $26$  fr. pr.  $\pounds$  = less than  $\$.186$  to fr., hence exchange is at a discount.  $500 \times 26$  fr. =  $13,000$  fr.  $\times .99\frac{1}{2} = 12,891\frac{1}{2}$  fr.

## AVERAGE OF PAYMENTS

248 Page 233

- 1  $\$180 \times 5 = 900$  mo.  
 $250 \times 8 = 2000$   
 $100 \times 9 = 900$  It equals the use of  $\$1$  for  $3600$  mo.  

---

 $\$530$        $3800$  mo.  
 $3800 \div \$530 = 7$  mo. 5 da.

2 \$  $800 \times 3 = 2\ 00$  mo.  $6400 \text{ mo.} \div 1800 = 3 \text{ mo. } 17 \text{ da.}$

$$\begin{array}{r} 1000 \times 4 = 4000 \\ \hline \$1800 \quad 6400 \text{ mo.} \end{array}$$

3 \$  $150 \times 3 = 450$  mo.

$$\begin{array}{r} 175 \times 4 = 700 \\ 200 \times 6 = 1200 \\ \hline \$525 \quad 2350 \text{ mo.} \end{array} \quad 2350 \div 525 = 4 \text{ mo. } 14 \text{ da.}$$

Apr. 8 + 4 mo. 14 da. = Aug. 22.

4 \$  $390 \times 16 = 6240$  da.  $15,740 \div 865 = 18 \text{ da.}$

$$\begin{array}{r} 475 \times 20 = 9500 \\ \hline \$865 \quad 15,740 \text{ da.} \end{array}$$

5 \$  $100 \times 1 = 100$  da.

$$\begin{array}{r} 150 \times 18 = 2700 \\ 200 \times 38 = 7600 \\ \hline \$450 \quad 10,400 \text{ da.} \end{array} \quad 10,400 \div 450 = 23 \text{ da.}$$

May 31 + 23 da. = June 23.

6 \$  $250 \times 8 = 2000 \div 400 = 5 \text{ mo.}$  Ans.

7  $550 \times 6 = 3300 \div 10 = \$330.$

8 \$  $1000 \times 10 = 10,000$  mo.

$$\begin{array}{r} \$250 \times 4 = 1000 \text{ mo. } 10,000 \text{ mo.} - 5000 \text{ mo.} = 5000 \text{ mo.} \\ 500 \times 8 = 4000. \quad 5000 \div \$250 \text{ (balance due)} = 20 \text{ mo.} \quad \text{Ans.} \\ \hline \$750 \quad 5000 \text{ mo.} \end{array}$$

9 \$  $400 \times 2 = 800$  mo.  $1940 \text{ mo.} \div 705 = 2 \text{ mo. } 23 \text{ da.}$

$$\begin{array}{r} 80 \times 3 = 240. \\ 225 \times 4 = 900. \quad \text{Mar. } 22 + 2 \text{ mo. } 23 \text{ da.} = \text{June } 14. \\ \hline \$705 \quad 1940 \text{ mo.} \end{array}$$

## AVERAGE

249 Page 235

1  $2 \times \$2.50 = \$5.00$

$3 \times 3.00 = 9.00$

$10 \times 3.25 = 32.50$

$\$46.50 \times 15 = \$3.10 \text{ each.}$

15 are w'th \$46.50

2  $10 \times \$ .90 = \$9.00$

$8 \times .95 = 7.60$

$7 \times 1.00 = 7.00$

$\$23.60 \div 25 = \$.94\frac{2}{5} \text{ per cen.}$

25 are w'th \$23.60

3  $45 \times \$ .08 = \$3.60$   $\$6.75 \times 1.10 = \$7.425 \text{ S.P.}$

$30 \times .10\frac{1}{2} = 3.15$

$\$7.425 \div 75 = .099\frac{2}{3} \text{ pr. lb.}$

75 lb. cost \$6.75

4  $8 \times \$ .40 = \$3.20$

$18 \times \$.50 = \$9.00 \text{ S. P.} - 8.20 \text{ C.} = \$.80 \text{ G.}$

$10 \times .50 = 5.00$

$\$.80 \text{ G.} \div \$8.20 \text{ C.} = 9\frac{1}{11}\%$

18 cost \$8.20

$\$.80 \div 18 = \$.04\frac{4}{9} \text{ per roll.}$

5  $50 \text{ gal.} \times \$ .35 = \$17.50$

$50 \times .42 = 21.00$

$5 \times .40 = 20.00$

$\$58.50 \div 200 = \$.29\frac{1}{4} \text{ per gal.}$

$50 \times .00$

200 gal. are worth \$58.50

6  $12 \text{ lb.} \times \$ .06 = \$ .72$

$9 \times .08 = .72$

$15 \times .11 = 1.65$

$\$5.30 \div 53 = \$.10 \text{ per lb.}$

$17 \times .13 = 2.21$

53 lb. are worth \$5.30

7	5 lb. × \$ .40 = \$2.00	24 × \$.30 = \$7.20	selling price.
7	× .25 = 1.75	- \$6.75	C. = \$.45 gain.
10	× .20 = 2.00		
2	× .50 = 1.00		
<hr/>			
24 lb. cost	\$6.75		

## 250 Page 236

Answers variable, one solution given)

1	65	55	5	5	Hence 5 lbs. of 55 ct.
		70	10 + 5	15	15 lbs. of 70 ct.
		60	5	5	5 lbs. of 65 ct.

Or any mixture in the ratio of

1 lb. of 55 ct., 1 lb. of 60 ct., and 3 lb. of 70 ct.

- 2 Three times the quantity of each, observing the ratio 1, 1, 3.

- 3 

\$1.00	\$1.50	100
\$0		50

 100 of wine to 50 water; or, the ratio 2, 1  
If 30 gal. wine be used, it would take 15  
gal. of water

- 4 20 gal. × \$.64 = 1280. \$2260 ÷ 34 = \$.66 $\frac{2}{17}$  per gal.

$$\begin{array}{r} 14 \\ 34 \end{array} \times .70 = \frac{980}{\$2260.}$$

52	35	4	4
	40	4	4
	50	14 $\frac{2}{17}$	14 $\frac{2}{17}$
	56	17 + 12	29
	66 $\frac{2}{17}$	2	2

These proportions multiplied by 17 give 34 gal. of the 64 and 70 ct. mixtures and fulfill all the conditions of the problem. ∴ One ans. will be 68 gal of 35 ct., 68 gal. of 40 ct., 246 gal. of 50 ct., and 493 gal. of 56 ct.

# PART IV

## POWERS, ROOTS AND MENSURATION

### Square Root

253 Page 240

$$\begin{array}{r} 1 \quad 10'24(32 \\ \quad \quad 9 \\ 62 \overline{)124} \\ \quad \underline{124} \end{array}$$

$$\begin{array}{r} 2 \quad 33'64(58 \\ \quad \quad 25 \\ 108 \overline{)864} \\ \quad \underline{864} \end{array}$$

$$\begin{array}{r} 3 \quad 640 \text{ A.} = 102,400 \text{ sq. rd.} \\ \quad \quad 10'24'00(320 \text{ rd.} \\ \quad \quad \quad \quad 9 \quad \quad \quad 4 \\ 62 \overline{)124} \quad \underline{1280 \text{ rds. Ans}} \\ \quad \underline{124} \\ \quad \quad 00 \end{array}$$

$$\begin{array}{r} 4 \quad 66 \text{ ft} \times 148 \frac{1}{2} \text{ ft} = 9801 \text{ sq ft.} \\ \quad \quad 98'01(99 \text{ ft.} \\ \quad \quad \quad \quad 81 \\ 189 \overline{)1701} \\ \quad \underline{1701} \end{array}$$

$$5 \quad 3200 \text{ sq. rd.} \times 2 = 1600 \text{ sq. rd.}$$

$$\begin{array}{r} 16'00(40 \text{ rd. breadth.} \\ \underline{16} \quad \underline{2} \\ 80 \text{ rd. length.} \end{array}$$

$$\begin{array}{r} 6 \quad 40'96(64 \text{ rd.} \\ \quad \quad 36 \\ 124 \overline{)496} \\ \quad \underline{496} \end{array}$$

$$\begin{array}{r} 7 \quad 12 \text{ rds. sq.} = 144 \text{ sq. rds.} \\ 144 \text{ sq. rds.} - 12 \text{ sq. rds.} \\ = 132 \text{ sq. rds.} \end{array}$$

$$\begin{array}{r} 12(3.46 \text{ rd. len'th of E.} \\ \quad \quad 9 \\ 64 \overline{)300} \\ \quad \underline{256} \\ 686 \overline{)4400} \\ \quad \underline{4116} \\ \quad \quad 184 \end{array}$$

12 rds. - 3.46 rds. = 8.54.  
[Example should read:  
What is the difference in the  
length of their sides?]

- 8 Metric.  $23 \times 2.47$  A.  $\times$   
 $160 = 9089.60$  sq. rds.

$$\begin{array}{r} 90'89.60(95.33 + \text{rd.} \\ 81 \quad 4 \\ 185 \overline{) 989} \quad 381.32 \text{ rd. A.} \\ 925 \\ 1903 \overline{) 6460} \\ 5709 \\ 19063 \overline{) 75100} \\ 57189 \end{array}$$

- 8  $4 \times 160$  sq. rd. =  $640$  sq. rd

$$\begin{array}{r} 6'40.(25.29 + \text{rd.} \\ 4 \quad 4 \\ 45 \overline{) 240} \quad 101.16 + \text{rd. Ans.} \\ 225 \\ 502 \overline{) 1500} \\ 1004 \\ 5049 \overline{) 49600} \\ 45441 \end{array}$$

- 9  $10 \times 160 = 16'00$

$$\begin{array}{r} 16'00 \text{ rd. (40 rd.} \\ 16 \quad 4 \\ \hline 00 \quad 160 \text{ rd. of fen.} \end{array}$$

$$1600 \text{ sq. rd. } \div 4 = 400 \text{ sq. rd.}$$

$$\begin{array}{r} 4'00 \text{ sq. rd. (20 rd.} \\ 4 \\ \hline 00 \end{array}$$

$$2 \text{ sides } 20 \text{ rds.} = 40 \text{ rds.}$$

$$2 \text{ S. } 4 \times 20 \text{ rds.} = 160 \text{ rds.}$$

$$\begin{array}{l} \$2.25 \times (200 - 160) = \\ \$90 \text{ in A's favor.} \end{array}$$

- 9 Metric.  $2 \times (387.5 \text{ m.} +$   
 $174.8 \text{ m.}) = 1124.6 \text{ m.}$

$$387.5 \text{ m.} \times 174.8 \text{ m.} =$$

$$67735 \text{ sq. m.}$$

$$\begin{array}{r} 6'77'35 \text{ sq. m. (260.2 m. S.} \\ 4 \quad 4 \\ 46 \overline{) 277} \quad 1040.8 \text{ n} \\ 276 \quad \text{dist. around sq.} \\ 5002 \overline{) 13500} \\ 10404 \end{array}$$

$$(1124.6 \text{ m.} - 1040.8 \text{ m.}) \times$$

$$1.25 \text{ fr.} = 104.75 \text{ fr.}$$

- 10  $72 \text{ rd.} \times 98 \text{ rd.} = 7056$   
 sq. rd.

$$\begin{array}{r} 70'56 (84 \\ 64 \\ 164 \overline{) 656} \\ 656 \end{array}$$

$$(72 \text{ rd.} + 98) \times 2 \text{ rd.} =$$

$$340 \text{ rd.}$$

$$4 \times 84 \text{ rd.} = 336 \text{ rd.}$$

$$340 \text{ rd.} : 336 \text{ rd.} :: \$425 :$$

$$(\$420.)$$

- 11  $128 \text{ in.} \times 32 \text{ in.} = 4096$   
 sq. in.

$$\begin{array}{r} 40'96(64 \\ 36 \\ 124 \overline{) 496} \\ 496 \end{array}$$

## CUBE ROOT

256 Page 245.

1  $261(21$

$$\begin{array}{r} 8 \\ 1200 \overline{) 1261} \\ 61 \\ 1 \\ \hline 1261 \end{array}$$

2  $1000 \text{ gal.} \times 231 = 231,000$   
cubic inches.

$$\begin{array}{r} 231'000 (61.3 + \\ 216 \\ 10800 \overline{) 15000} \\ 180 \\ 1 \\ \hline 10981 \end{array}$$

$$\begin{array}{r} 1116300 \\ 1830 \\ 9 \\ \hline 1118139 \end{array} \quad \begin{array}{r} 3354417 \\ 664583 \end{array}$$

3  $\sqrt[3]{576} = 24 \text{ in.} = 2 \text{ ft. on a S.}$   
 $2^3 = 8 \text{ cu. ft.}$

4  $3750 \text{ sq. in.} \div 6 = 625 \text{ area}$   
of one face.  $\sqrt[3]{625} = 25 \text{ E.}$   
 $25^3 = 15625 \text{ cu. in.} \div 231 =$   
 $67.64 \text{ gal.}$

5  $2744 (14 \text{ in. edge}$

$$\begin{array}{r} 1 \\ 300 \overline{) 1744} \\ 120 \\ 16 \\ \hline 436 \end{array}$$

$14^3 = 196 \text{ sq. in.} \times 6 =$

$1176 \text{ sq. in.}$

6  $\frac{1}{2} \text{ of } 4^3 = 32.$   
 $32 (3.17 + \text{ft.}$   
 $27$

$$\begin{array}{r} 2700 \overline{) 5000} \\ 90 \\ 1 \\ \hline 2791 \\ 288300 \\ 6510 \\ 49 \\ \hline 294859 \end{array} \quad \begin{array}{r} 2791 \\ 2209000 \\ 2064013 \end{array}$$

7  $1^3 : 2^3 :: 1728 \text{ cu. in.} : (13284$   
cubic inches.

8  $4238 \text{ kilos.} = 4238 \text{ cu. dm.,}$   
 $\div 1000 = 4.238 \text{ cu. m.}$   
 $4.238 \text{ cu. m.} (1.6 + \text{m.}$

$$\begin{array}{r} 1 \\ 300 \overline{) 3238} \\ 180 \\ 36 \\ \hline 516 \end{array} \quad \begin{array}{r} 3238 \\ 3096 \end{array}$$

9  $225 \text{ m.} \times 14.2 \text{ m.} \times .025 \text{ m.}$   
 $= 79.875 \text{ cubic m.}$



## TRIANGLES

257 Page 248

1  $10^2 + 10^2 = 2'00(14.14$

$$\begin{array}{r} 1 \\ 24 \overline{)100} \\ 96 \\ \hline 281 \overline{)400} \\ 281 \\ \hline 2824 \overline{)11900} \\ 11296 \\ \hline \end{array}$$

2  $20^2 - 15^2 = 1'75(13.228$

$$\begin{array}{r} 1 \\ 23 \overline{)75} \\ 69 \\ \hline 262 \overline{)600} \\ 500 \\ \hline 2642 \overline{)7600} \\ 5284 \\ \hline 26448 \overline{)231600} \\ 217584 \\ \hline \end{array}$$

3  $25^2 - 18^2 = 3'01(17.349$

$$\begin{array}{r} 1 \\ 27 \overline{)201} \\ 189 \\ \hline 343 \overline{)1200} \\ 1029 \\ \hline 3464 \overline{)17100} \\ 13856 \\ \hline 34689 \overline{)324400} \\ 312201 \\ \hline \end{array}$$

4  $40^2 + 30^2 = 25'00(50$

$$\begin{array}{r} 25 \\ \hline 00 \end{array}$$

5  $8^2 + 3^2 = 73(8.54$

$$\begin{array}{r} 64 \\ 165 \overline{)900} \\ 825 \\ \hline 1704 \overline{)7500} \\ 6816 \\ \hline \end{array}$$

6  $22^2 + 6^2 = 5'20(22.8$

$$\begin{array}{r} 4 \\ 42 \overline{)120} \\ 84 \\ \hline 448 \overline{)3600} \\ 3584 \\ \hline \end{array}$$

7  $22.8 + ^2 = 520 - 9^2 = 4'39$

$$\begin{array}{r} 4'39(20.95 \\ 409 \overline{)3900} \\ 3681 \\ \hline 4185 \overline{)21900} \\ 20925 \\ \hline \end{array}$$

8  $60^2 + 24^2 = 41'76(64.62$

$$\begin{array}{r} 36 \\ 124 \overline{)576} \\ 496 \\ \hline 1286 \overline{)8000} \\ 7716 \\ \hline 12922 \overline{)28400} \\ 25844 \\ \hline \end{array}$$

9  $250^2 - 65^2 = 5'82'75(241.4$

$$\begin{array}{r} 4 \\ 44 \overline{)182} \\ 176 \\ \hline 481 \overline{)675} \\ 481 \\ \hline 4824 \overline{)19400} \\ 19296 \\ \hline \end{array}$$

$$10 \quad 14^2 + 14^2 = 392(19.79)$$

$$\begin{array}{r} 1 \\ 29 \overline{) 292} \\ \underline{261} \\ 387 \overline{) 3100} \\ \underline{2709} \\ 949 \overline{) 39100} \\ \underline{35541} \end{array}$$

$$(19.79 + 14 = 33.79.)$$

$$11 \quad 40^2 + 30^2 + 12^2 = 2644$$

$$\begin{array}{r} 26'44(51.419 \\ 25 \\ 101 \overline{) 1144} \\ \underline{101} \\ 1024 \overline{) 4300} \\ \underline{4096} \\ 10281 \overline{) 20400} \\ \underline{10281} \\ 102829 \overline{) 1011900} \\ \underline{925881} \end{array}$$

$$12 \quad 82^2 - 36^2 = 5428(73.67)$$

$$\begin{array}{r} 49 \\ 143 \overline{) 528} \\ \underline{429} \\ 1466 \overline{) 9900} \\ \underline{8796} \\ 14727 \overline{) 110400} \\ \underline{103089} \end{array}$$

$$73.67 + 10 = 83.67 \text{ ft}$$

$$13 \quad 10 \text{ A.} \times 160 = 1600$$

$$16'00(40 \text{ rd. on side})$$

$$\begin{array}{r} 16 \\ \underline{00} \end{array}$$

$$40^2 + 40^2 = 32'00(56.568)$$

$$\begin{array}{r} 25 \\ 106 \overline{) 700} \\ \underline{636} \end{array}$$

$$1125 \overline{) 6400}$$

$$5625$$

$$11306 \overline{) 77500}$$

$$67836$$

$$113128 \overline{) 966400}$$

$$\underline{905024}$$

$$14 \quad \text{Ans.} = \frac{1}{2} \text{ length of side.}$$

$$40 \text{ rd.} \div 2 = 20 \text{ rd.}$$

$$15 \quad \sqrt[3]{729} = 9 \text{ length of side.}$$

$$9^2 + 9^2 + 9^2 = 243$$

$$243(15.588)$$

$$\begin{array}{r} 1 \\ 25 \overline{) 143} \\ \underline{125} \end{array}$$

$$305 \overline{) 1800}$$

$$1525$$

$$3108 \overline{) 27500}$$

$$24864$$

$$31168 \overline{) 263600}$$

$$\underline{249344}$$

$$16 \quad 15^2 \div 2 = 112.50$$

$$1'12.50(10.6 + \text{rd. side})$$

$$206 \overline{) 1250}$$

$$\underline{1236}$$

$$(10.6 +)^2 = 112.50 \text{ rd.}$$

$$17 \quad 28^2 - 18^2 = 4'60(21.44$$

$$\begin{array}{r} 41 \overline{)60} \\ 41 \\ \hline 24 \overline{)1900} \\ 168 \\ \hline 284 \overline{)20400} \\ 16836 \\ \hline \end{array}$$

$$28^2 - 15^2 = 5'59(23.64$$

$$\begin{array}{r} 4 \overline{)59} \\ 43 \overline{)159} \\ 129 \\ \hline 466 \overline{)3000} \\ 2796 \\ \hline 4724 \overline{)20400} \\ 18896 \\ \hline \end{array}$$

$$23.64 \text{ ft.} + 21.44 \text{ ft.} = 45.08 \text{ ft. Ans.}$$

$$18 \quad 58^2 + 72^2 = 85'48(92.45$$

$$\begin{array}{r} 81 \\ 182 \overline{)448} \\ 364 \\ \hline 1844 \overline{)8400} \\ 7376 \\ \hline 18445 \overline{)102400} \\ 92225 \\ \hline \end{array}$$

$$19 \quad 2\frac{1}{2} \text{ ft.} = 30 \text{ in.}$$

$$1\frac{1}{2} \text{ ft.} = 18 \text{ in.}$$

$$30^2 + 18^2 + 12^2 = 1368$$

$$13'68(36.98 \text{ in.}$$

$$\begin{array}{r} 9 \overline{)68} \\ 66 \overline{)468} \\ 396 \\ \hline 729 \overline{)7200} \\ 6561 \\ \hline 7388 \overline{)63900} \\ 59104 \\ \hline \end{array}$$

$$36.98 \text{ in.} = 3 \text{ ft. } .98 \text{ in.}$$

$$20 \quad \text{Height to eaves 20 ft.} \\ 30 \text{ ft.} - 20 \text{ ft.} = 10 \text{ feet} \\ \text{height of roof from eaves}$$

$$18^2 + 10^2 = 4'24(20.59$$

$$\begin{array}{r} 405 \overline{)2400} \\ 2025 \\ \hline 4109 \overline{)37500} \\ 36981 \\ \hline \end{array}$$

## SURFACES

258 Page 250

$$1 \quad 20 \text{ rd.} \times 18 \text{ rd.} \div 2 = 180 \text{ sq. rd.}$$

$$2 \quad (25 \text{ rd.} + 35 \text{ rd.}) \div 2 = 30 \text{ rd.} \quad 30 \text{ rd.} \times 13 \text{ rd.} = 390 \text{ sq. rd.}$$

$$3 \quad 11 \text{ rd.} \times 2 \times 3.1416 = 69.1152 \text{ rd.} \quad 11^2 \times 3.1416 = 380.1336$$

- 4  $(13 \text{ ft.} \times 10 \text{ ft.}) \div 2 = 65 \text{ sq. ft.}$   $65 \text{ sq. ft.} \div 3.1416 = 20.690412 =$   
radius<sup>2</sup>.  $\sqrt{20.690412} = 4.548 \text{ ft.}$
- 5  $40^2 \times 3.1416 = 5026.56 \text{ sq. ft.} \div (9 \times 30\frac{1}{2}) = 18.46 + \text{sq. rd.}$
- 6  $3^2 \times .7854 = 70.686 \text{ sq. ft.}$
- 7  $6 \text{ ft.} \times 5.196 \text{ ft.} \div 2 = 15.588$ . Area of one triangle,  $\times 6 = 93.528$   
sq. ft.,  $\div 9 = 10.4 \text{ sq. yd.}$
- 8  $135 \text{ sq. rd.} \times 2 = 270 \text{ sq. rds.}$  or area of full rectangle,  $\div 18 \text{ rd.}$   
 $= 15 \text{ rd. side.}$
- 9  $72^2 = 5184 \div 2 = 2592 \text{ sq. ft.} = \text{square of 1 side} = \text{area of square.}$   
 $\frac{1}{2}$  of  $2592 \text{ sq. ft.} = 1296 \text{ sq. ft.}$  Area of triangle.
- 10  $256 \text{ sq. ft.} \div (\frac{1}{2} \text{ of } 12 \text{ ft.}) = 42\frac{2}{3} \text{ ft.} = 42 \text{ ft. } 8 \text{ in.}$
- 11  $(12 \text{ in.} + 6 \text{ in.}) \div 2 = 9 \text{ in. aver.}$   $18 \text{ ft.} \times \frac{1}{4} \text{ ft.} = 13\frac{1}{2} \text{ sq. ft.}$
- 12  $12 \text{ ft. } 6 \text{ in.} = 150 \text{ in.}$   $150 \text{ in.} \div 3.1416 = 47.746 \text{ in.}$
- 13  $\sqrt{1} : \sqrt{9} :: 10 : ( )$ ; or,  $1 : 3 :: 10 : (30)$ ;  $\sqrt{1} : \sqrt{4} :: 10 : (20)$ .
- 14  $20^2 - 5^2 = 375 \text{ ft. (square of radius).}$   
 $375 \text{ ft.} \times 3.1416 = 1178.10 \text{ sq. ft.}$   $20^2 \times 3.1416 = 1256.64 \text{ sq. ft.}$   
 $1256.64 \text{ sq. ft.} - 1178.10 \text{ sq. ft.} = 78.54 \text{ sq. ft.}$
- 15  $1 \text{ A.} = 160 \text{ sq. rd.,} \div .7854 = 203.7108 \text{ (sq. of diam.).}$   
 $\sqrt{203.7108} = 14.27 + \text{rd. diam.}$   $14.27 \text{ rd.} \times 3.1416 \times \$2 = \$89.66 +$
- 16  $(54 \text{ rd.} \times 72 \text{ rd.}) \div 2 = 1944 \text{ sq. rd.,} \div 160 = 12\frac{1}{10} \text{ A.;}$   
 $12\frac{1}{10} \times \$125 = \$1518.75.$

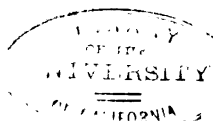
- 17  $(108 \text{ rd.} + 144 \text{ rd.}) \div 2 = 126 \text{ rd. aver.}$   
 $126 \text{ rd.} \times 96 \text{ rd.} \div 160 = 75\frac{3}{4} \text{ A.,} \times \$85 = \$6426 \text{ cost of land.}$   
 $(108 + 144 + 195.34) \text{ rds.} = 447.34 \text{ rd.,} \times \$1.75 = \$782.84\frac{1}{2} \text{ cost}$   
of fence.  $\$6426 + 782.845 = \$7208.845.$
- 18  $(12 \text{ ft.} + 8 \text{ ft.}) \times 2 \text{ ft.} \times 2 = 80 \text{ sq. ft.}$       $2 \text{ ft.} \times 2 \text{ ft.} \times 4 = 16 \text{ sq. ft.}$   
corners.  $80 \text{ sq. ft.} + 16 \text{ sq. ft.} = 96 \text{ sq. ft.}$
- 19  $4 \text{ ft.} \times 3.1416 = 12.5664 \text{ ft. circum.}$   $5280 \text{ ft.} \div 12.5664 \text{ ft.} = 420 +$
- 20  $31.5 \text{ A.} \times 160 = 5040 \text{ sq. rd. (also sq. of one side.)}$   
 $5040 \div 5040 = 10,080. \sqrt{10080} = 100.399 \text{ rd. diagonal.}$   
 $5040 \text{ sq. rd.} \div .7854 = 6417.11 \text{ sq. rd. (sq. of diameter.)}$   
 $\sqrt{6417.11} = 80.10 \text{ rd. diam. } 80.10 \text{ rd.} \times 3.1416 = 251.6 \text{ rd. circum.}$

## SOLIDS

## 259 Page 254

- 1  $4 \times 3 \times 2 = 24 \text{ cu. ft.}$
- 2  $4 \text{ ft.} \times 3 \text{ ft.} \times 2 = 24 \text{ sq. ft. S.}$   $4 \text{ ft.} \times 2 \text{ ft.} \times 2 = 16 \text{ sq. ft. top and bot.}$   
 $3 \text{ ft.} \times 2 \text{ ft.} \times 2 = 12 \text{ sq. ft. ends. } (24 + 16 + 12) \text{ sq. ft.} = 52 \text{ sq. ft.}$
- 3  $5 \text{ in.} \times 3.1416 \div 12 = 1.309 \text{ ft. cir.}$   $1.309 \text{ ft.} \times 2\frac{1}{2} \text{ ft.} = 3.27\frac{1}{4} \text{ sq. ft.}$
- 4  $6 \text{ in.} \times 3.1416 = 18.8496 \text{ in. cir.} \times 8 \text{ in.} = 150.7968 \text{ sq. in. side.}$   
 $6^2 \times .7854 = 28.2744 \text{ sq. in. area of bottom.}$   
 $150.7968 \text{ sq. in.} + 28.2744 \text{ sq. in.} = 179.0712 \text{ sq. in.}$
- 5 Area of base  $28.2744 \text{ sq. in.} \times 8 \text{ in.} = 226.1952 \text{ cu. in.} \div 231 =$   
.979 gal. = 3.91 qt.

- 6  $12^2 \times .7854 = 113.0976$  sq. in.,  
 $8^2 \times .7854 = 50.2656$  sq. in. area of bases.  
 $113.0976 \times 50.2656 = 5683.90.$   $\sqrt{5683.90} = 75.38.$   
 $113.0976 + 50.2656 + 75.38 = 238.74 \times 10 \times \frac{1}{3} = 795.8 +$  cu. in.
- 7  $(12 \text{ in.} + 8 \text{ in.}) \div 2 \times 3.1416 = 31.416$  in. av. circum.  
 $31.416 \text{ in.} \times 10 \text{ in.} = 314.16$  sq. in.  
Area of bottom  $50.265$  sq. in.  $+ 314.16$  sq. in.  $= 364.885$  sq. in.,  
 $\div 144 = 2.53$  sq. ft.
- 8  $1 \text{ qt.} = 57\frac{1}{4}$  cu. in.  $3^2 \times .7854 = 7.0686$  sq. in. area of bottom.  
 $57\frac{1}{4} \div 7.0686 = 8.17$  in.
- 9  $12^2 \times 3.1416 = 452.3904$  sq. in.  $= 3.1416$  sq. ft.
- 10  $1^2 \times .7854 \times 1 \text{ in.} = .7854$  cu. in.  $57\frac{1}{4}$  cu. in.  $\div .7854 = 73\frac{1}{2}.$
- 11  $12^2 \times .7854 = 113.0976$  sq. ft. (area of base).  
 $113.0976 \text{ sq. ft.} \times 6 \text{ ft.} \times \frac{1}{3} = 226.952$  sq. ft.  
 $226.952 \text{ cu. ft.} \times 128 = 1 \text{ cd. } 98.952 \text{ cu. ft.}$
- 12  $12^2 \times .07958 = 11.45952$  area of base  
 $11.45952 \text{ sq. ft.} \times 2 \times \frac{1}{3} = 7.63968$  cu. ft.  
 $7.63968 \text{ cu. ft.} \times 1728 = 13201.428$  cu. in.,  $\div 2150.4 = 6.14 +$  bu.
- 13  $12 \div 3.1416 = 3.82$  ft. diam.,  $\div 2 = 1.91$  ft. radius.  
 $1.91^2 + 2^2 = 7.6481.$   $\sqrt{7.6481} = 2.765$  slant height.  
 $12 (\text{cir.}) \times 2.765 (\text{slant H.}) \times \frac{1}{3} = 16.59$  sq. ft.  $= 1.844 +$  yd.
- 14  $20 \times 231 \text{ cu. in.} = 4620 \text{ cu. in.}$   
 $18^2 \times .7854 = 254.4696$  area of base.  
 $4620 \text{ cu. in.} \div 254.4696 \text{ sq. in.} = 18.16 \text{ in. depth.}$



- 15  $254.4696 \text{ sq. in. (area of base)} \times 4 \text{ in.} \times \frac{1}{2} =$   
 $339.2928 \text{ cu. in.,} \div 231 = 1.47 \text{ gal.}$
- 16  $4 \times .5286 = 33.5104 \text{ cu. in.,} \div 57\frac{1}{2} = .58 \text{ qt.}$
- 17  $5 \times 231 \text{ cu. in.} = 1155 \text{ cu. in. } 1155 \div 10^3 = 11.55 \text{ in. depth.}$
- 18  $(12 + 16) \times 10 \times 2 = 560 \text{ sq. ft. area of sides, } 16 \text{ ft.} \times 12 \text{ ft.} = 192 \text{ sq.}$   
 $\text{ft. floor. } 192 \text{ sq. ft.} \div .07958 = 2412.6665 \text{ circum.}^2 \sqrt{2412.6665}$   
 $= 49.119 \text{ ft. circum.,} \times 10 = 491.19 \text{ ft. wall. } 560 \text{ sq. ft.} -$   
 $491.19 \text{ ft.} = 68.80 \text{ sq. ft.}$
- 19  $60 \text{ ft.} \times 40 \text{ ft.} \times 20 \text{ ft.} = 48,000 \text{ cu. ft. } 60 \text{ ft.} \times 40 \text{ ft.} \times 8 \text{ ft.} \times \frac{1}{2}$   
 $= 6400 \text{ cu. ft. } 48,000 \text{ cu. ft.} + 6400 \text{ cu. ft.} = 54,400 \text{ cu. ft.}$
- 20  $14^3 \times .7854 = 153.936 \text{ cu. in. } 153.936 \div 144 \times 20 = 21.38 \text{ cu. ft.}$
- 21  $8000^2 \text{ mi.} \times 3.1416 = 201,062,400 \text{ sq. mi. surface.}$   
 $201,062,400 \text{ sq. mi.} \times 8000 \text{ mi.} \times \frac{1}{2} = 268,083,200,000 \text{ cu.in. vol.}$
- 22  $36 \text{ rds.} = 594 \text{ ft. } (28 \text{ in.} + 18 \text{ in.}) \div 2 = 23 \text{ in. average width}$   
 $594 \text{ ft.} \times 4 \text{ ft.} \times \frac{2}{3} \text{ ft.} = 4554 \text{ cu ft.,} \times \$ .28 = \$1275.12.$   
 More exact solution:  $594 \text{ ft.} \times \frac{2}{3} \text{ ft.} = 1386 \text{ sq. ft.; } 594 \text{ ft.} \times$   
 $\frac{2}{3} \text{ ft.} = 891 \text{ sq. ft. } 1386 \times 891 = 1,234,926. \sqrt{1234926} = 1111.27$   
 $\text{sq. ft.,} + 1386 \text{ sq. ft.} + 594 \text{ sq. ft.} = 3388.27 \text{ sq. ft. } 3387.27 \text{ sq.}$   
 $\text{ft.} \times 4 \text{ ft.} \times \frac{1}{2} = 45176.9\frac{1}{2} \text{ cu. ft., (vol. of pyramid)} \times \$ .28 =$   
 $\$1264,953.$
- 23  $594 \text{ ft.} \times (\frac{2}{3} \text{ ft.} + \frac{1}{3} \text{ ft.}) = 1584 \text{ sq. ft.,} \times \frac{1}{2} \text{ ft.} = 1056 \text{ cu. ft.,} \times \$ .32$   
 $= \$337.92.$
- 24  $3.12 \text{ in.} \times 3 \text{ in.} \times \frac{1}{2} = 5.43 \text{ sq. in. area of one triangle,} \times 8 =$   
 $43.44 \text{ sq. in. area of base. } 43.44 \text{ sq. in.} \times 120 \text{ in.} = 5312.8 \text{ cu.}$   
 $\text{in.,} \div 1728 = 3.0745 \text{ cu. ft.}$

## MISCELLANEOUS

261 Page 257.

- 1  $\frac{1}{2} + \frac{1}{1\frac{1}{2}} + \frac{1}{2\frac{1}{2}} + \frac{1}{4\frac{1}{2}} = \frac{1}{1\frac{1}{2}}$ .  
 $\frac{1}{1\frac{1}{2}} - \frac{1}{1\frac{1}{2}} = \frac{1}{1\frac{1}{2}} = \frac{1}{1\frac{1}{2}}$ .  
 $\$150 \div \frac{1}{1\frac{1}{2}} = \$220.50$ .
- 2  $\$1714.275 \div \$1.425 = \$1203$ .  $7 \times 30 \times \$2 + \$27 = \$447$ .  
 $\$1203 - \$447 = \$756, \div 210 = \$3.60$ .
- 3 Amt. of \$1 at C. Int. for five years = \$1.343916.  
 $\$5000 \div \$1.343916 = \$3720.47$ .
- 4  $800 \times \$4.75 = \$3800, \times .01\frac{1}{2} = \$66.50$  com.  
 $\$3800 - \$66.50 = \$3733.50, \div 1.02 = \$3660.29 \div .06\frac{1}{2} = 56312$  lb.  
 $\$3733.50 - 3660.29 = \$73.21$  com.  $\$66.50 + \$73.21 = \$139.71$
- 5  $4\frac{1}{2}$  A.  $\times 160 = 720$  sq. rds  $\div (9 \times 5) = 16$  sq. rd.  $\sqrt{16} = 4$ .  
 $4$  rd.  $\times 5 = 20$  width.  $4$  rd.  $\times 9 = 36$  rd. length.  
 $(20$  rd.  $+ 36$  rd.)  $\times 2 = 112$  rd.  $\times 16\frac{1}{2} = 1848$  ft. dist. around field.  
 $1848$  ft.  $\div 8$  ft. = 231 number of posts required  
 $1848$  ft.  $\times 8\frac{1}{2}$  ft. = 15,708 ft. close boards.  
 $1848$  ft.  $\times 2 \times 4 \div 12 \times 2 = 2404$  ft. scantling  
 $231$  ft.  $\times 8 \times 5 \times 5 \div 12 = 3850$  ft. posts.  
32.022 M.  
 $\$440.44 \div 22.022 = \$20$ .
- 6  $327.46$  ares  $\div 3 = 109.15\frac{1}{3}$  ares  $\times 100 = 10915\frac{1}{3}$  sq. mi.  
 $\sqrt{10915\frac{1}{3}} = 104.48$  - m. wide.  $104.48 \times 3 = 313.4$  + m. long.
- 7  $9\frac{1}{10} + 7\frac{1}{2}$   $16\frac{2}{3} \div 7\frac{1}{2} \times 41\frac{1}{11} = \frac{14^2}{10} \times \frac{1}{2} \times \frac{16^2}{11} = 86\frac{1}{11}$ .
- 8  $17$  ft.  $204$  in.  $\div 39.37 = 5.1816$  m.  $13$  ft.  $2$  in. =  $158$  in. =  
 $4.0132$  m.  $5.1816$  m.  $\times 4.0132$  m. =  $20.791$  sq. m.  $\times .85 = \$17.67$



- 9  $5.13875 \text{ mi.} \times 320 + 25.312 \text{ rd.} = 1669.712 \text{ rd.}, \times 5\frac{1}{4} = 9183.416 \text{ yd.}$   
 $- 147.3125 \text{ yd.} = 9036.1035 \text{ ft.}, \times 3 = 27,108.31 \text{ ft.}$
- 10  $124^2 = 153.76 \text{ sq. m.} \times 3\frac{1}{4} = 483 \text{ sq. m.} \div 100 = 4.83 \text{ ares.}$
- 11  $36 \text{ A.} \times 160 = 5760 \text{ sq. rd.} \div (9 \times 10) = 64 \text{ sq. rd.}$   $\sqrt{64} = 8.$   
 $8 \times 9 = 72 \text{ rds. width.}$   $8 \times 10 = 80 \text{ rds. length.}$   
 $72 \text{ rds. (1188 ft.)} \times 60 \text{ ft.} \times 2 = 142,560 \text{ sq. ft. for 2 streets.}$   
 $80 \text{ rds. (1320 ft.)} \times 80 \text{ ft.} \times 3 = 316,800 \text{ sq. ft. for 3 streets.}$   
 $142560 \text{ sq. ft.} + 316,800 \text{ sq. ft.} = 459,360 \text{ sq. ft. for streets}$   
 $36 \text{ A.} \times 43,560 \text{ sq. ft.} = 1,568,160 \text{ sq. ft.} - 459,360 \text{ sq. ft.} =$   
 $1,108,800 \text{ sq. ft.}$
- 12  $36 \text{ A.} \times \$500 = \$18,000 + \$800 = \$18,800.$   $\$42,240 - \$18,800 =$   
 $\$23,440 \text{ gain.}$   $\$23,440 \div \$18,800 = 124\frac{1}{4}\%.$
- 13  $220 \times 1.08\frac{1}{4} = \$239.25.$   $\$500 - \$239.25 = \$260.75 \div \$239.25 =$   
 $109\%.$
- 14  $278.54 \text{ ares} \times 100 = 27,854 \text{ sq. m.} \div .7854 = 35,464.73 \text{ sq. m.}$   
 $\sqrt{35,464.73} = 188.32 \text{ m.}$
- 15  $\frac{1}{4} \text{ of } 8\% = 2\frac{3}{4}\%; \frac{1}{4} \text{ of } 12\% = 3\%; \frac{1}{4} \text{ of } 16\% = 3\frac{1}{4}\%; \frac{1}{4} \text{ of } 20\% = 4\frac{1}{4}\%$   
 $15\% - (2\frac{3}{4}\% + 3\% + 3\frac{1}{4}\% + 4\frac{1}{4}\%) = 13\frac{1}{4}\% = 1\frac{1}{4}\%.$   
 $\$54 \div .01\frac{1}{4} = \$3000.$   $\$3000 \div 3000 = \$1 \text{ per cental.}$
- 16  $\$1.00 - .01\frac{1}{4} = .98\frac{3}{4}.$   $\$.98\frac{3}{4} \div 1.025 = .96 \text{ invested from each}$   
 $\text{dollar.}$   $1.00 - .96 = .04 \text{ com.}$   $\$241.40 \div .04 = \$6035.$   
 $\$6035 \times .96 = \$5793.60 \text{ cotton investment.}$
- 17  $\$1 \text{ of note cost me } \$.66\frac{2}{3} \times 1.25 = \$.83\frac{1}{3}, \times .95 = \$.79\frac{1}{3} \text{ proceeds.}$   
 $\$.79\frac{1}{3} \text{ proceeds} - \$.66\frac{2}{3} \text{ cost} = \$.12\frac{1}{3} \text{ gain.}$   $\$75 \times .12\frac{1}{3} = \$600$   
 $\text{face of note.}$

- 18  $\left. \begin{array}{l} 8 \text{ hr.} : 10 \text{ hr.} \\ 40 \text{ da.} : 60 \text{ da.} \\ 1 : 2 \end{array} \right\} : : 4 \text{ men} ; (15 \text{ men}).$
- 19  $5\frac{1}{2} \text{ rd.} \times 5\frac{1}{2} \text{ rd.} = 30\frac{1}{4} \text{ sq. rd.}$
- 20  $34.28 \text{ ares} \times 100 = 3428 \text{ sq. m.} \div (\frac{1}{2} \text{ of } 39.4 \text{ m.}) = 174.01 \text{ m.}$
- 21  $1 \text{ mi. sq.} = 640 \text{ A.} \div 2.47 \text{ A.} = 259.11 + \text{ares.}$
- 22  $\$3600 \times 1.30 = \$4680 \text{ marked price. } .90 \times .95 = .855.$   
 $\$4680 \times .855 = \$4001.40.$
- 23  $\$1 + .01 \text{ premium} = \$1.01 - .01 \text{ interest} = \$1.00.$   
 $502.25 \times \$1 = \$502.25.$
- 24  $\frac{3}{4} - \frac{1}{10} = \frac{13}{20}$ ;  $3 + \frac{2}{3} = 3\frac{2}{3}$ ;  $1\frac{1}{2} + \frac{5}{7} = \frac{17}{14}$ ;  $3 - 1\frac{1}{2} = 1\frac{1}{2} \times 5 = \frac{5}{2}$ .  
 $\frac{13}{20} \times \frac{1}{3} = \frac{13}{60}$ ;  $1\frac{1}{2} + \frac{5}{7} = \frac{17}{14}$ ;  $\frac{13}{60} \div \frac{17}{14} = .2169 +.$
- 25  $7 + 11 = 18.$  A's share =  $\frac{7}{18}$  of 540 A. = 210 A. B's share =  $\frac{11}{18}$  of 540 A. = 330 A.
- 26  $(3.64 \text{ m.})^2 \times 3.1416 = 41.62494336 \text{ sq. m. surface.}$   
 $3.64^3 = 48.3287 + \text{cu. m.} \times .5236 = 25.3049 \text{ cu. m.}$
- 27  $80 \div \$1.75 = \$140$  amount he would have received.  
 $\$140 - 80 = \$60 \text{ amt. loss} \div (\$1.75 + \$.75 \text{ daily loss}) = 24 \text{ days}$   
 $\text{loss. } 80 \text{ da.} - 24 \text{ da.} = 56 \text{ working days.}$
- 28  $\frac{3}{4} \text{ A.} = \frac{3}{4} \text{ B.}$   $\frac{3}{4} \text{ A's} = \frac{3}{4} \text{ B's} \div \frac{3}{4} = \frac{3}{4} \text{ B's.}$   $\frac{3}{4} \text{ B's} + \frac{3}{4} \text{ B's} = \frac{1}{2} \text{ B's}$   
 $= 136 \text{ yrs. } \frac{1}{2} \text{ B's} = 136 \div 17 = 8.$  A's =  $8 \times 8 \text{ yrs.} = 64 \text{ yrs.}$   
 $s = 8 \times 9 \text{ yrs.} = 72 \text{ yrs.}$
- 29  $2.8^2 \times .7854 = 6.1575 + \text{sq. m. area of base,} \times 3.8 = 23.3985 \text{ cu.}$   
 $\text{m.} \times 1000 = 23,398.5 \text{ litres or kg.}$

- 30  $\frac{1}{2}$  of quantity = 56 A. 18 sq. rd., + 4 A. 126 sq. rd. =  
60 A. 144 sq. rd. A's share.  
Quantity - A's share = 388 A.,  $\times \frac{1}{3}$  = 77 A. 96 sq. rds. B's share.  
388 A. - B's share = 310 A. 64 sq. rd.  $\times \frac{1}{3}$  = 103 A. 74 $\frac{2}{3}$  sq. rd.  
C's share.  
310 A. 64 sq. rd. - C's share = 206 A. 149 $\frac{1}{3}$  sq. rd. D's share.
- 31 Dist. around = 5 rds.  $\times 4$  = 330 ft. (length)  $\times 3$  ft. (width) +  
3 ft.  $\times 3$  ft.  $\times 4$  (corners) = 1026 sq. ft.  
Vol. of earth = 5 rds.  $\times 5$  rds.  $\times 6$  in. = 3403 $\frac{1}{2}$  cu. ft.  
3003 $\frac{1}{2}$  cu. ft.  $\div$  1026 sq. ft. = 3.3168 + ft. deep.
- 32 43.6 m.  $\times 27.9$  m.  $\times .16$  m. = 194.6304 cu. m.  $\times 1000$  =  
194,630.4 kilograms.
- 33  $10^3 \times .7854 \times 10$  = 785.4 cu. ft.  $\times 1728$  = 1,357,171.2 cu. in.,  $\div$   
(63  $\times$  231 cu. in. = 14,553 cu. in.) = 93.257 hoghead.
- 34 £1 = \$4.866,  $\div 20$  = \$.243 value of shilling.  
\$1  $\div$  \$.243 = 4 s. 1.38 d. value \$1.  
1 fr. = \$.186. \$1  $\div$  \$.186 = 5.376 fr. value \$1.
- 35 58.248 cu. m.  $\div$  (3.7 m.  $\times$  3.42 m. = 12.654 sq. m.) = 4.6 + m.
- 36  $550 \times \$1.80$  = \$990,  $\times 1.02\frac{1}{2}$  = \$1012.275, + \$17 = 1029.275,  $\times$   
 $1.00\frac{1}{2}$  = \$1031.848 + .
- 37 \$750 =  $\frac{1}{2}$  prin. Prin. = \$600. Int. \$150. Int. on \$600 3 yrs.  
@ 1% = \$18. \$150  $\div$  \$18 = 8 $\frac{1}{3}$ ,  $\times 1\%$  = 8 $\frac{1}{3}\%$ .
- 38 32.5 m.  $\times 3.2$  m.  $\times 1$  8 m. = 187.2 cu. m., or sterens.

- 39  $3\frac{1}{2}$  days +  $14\frac{1}{2}$  days = 18 days.  $\$53 \div 18 = \$2.94\frac{4}{9}$  per day.  
 $3\frac{1}{2} \times \$294\frac{4}{9} = \$10.3055$  share of one.  
 $14\frac{1}{2} \times \$294\frac{4}{9} = 42.69\frac{4}{9}$  share of other.
- 40  $\frac{1}{8}$  of  $\$5400 = \$1800$  C's share.  $8000 + 10,000 = 18,000$ .  
 A's share =  $\frac{8}{18}$ . B's share =  $\frac{1}{9}$ .  
 $\$5400 - \$1800 = \$3600$ .  $\frac{8}{18}$  or  $\frac{4}{9}$  of  $\$3600 = \$1600$  A's share.  
 $\frac{1}{9}$  or  $\frac{1}{9}$  of  $\$3600 = \$2000$  B's share.
- 41  $\left. \begin{array}{l} 52 \text{ men} : 45 \text{ men} \\ 45 \text{ ft.} : 60 \text{ ft.} \\ 10 \text{ ft.} : 8 \text{ ft.} \\ 15 \text{ da.} : 25 \text{ da.} \end{array} \right\} :: 355 \text{ ft.} : (546\frac{2}{3} \text{ ft.})$
- 42  $\$3.50 \text{ C.} \times 1.20 = \$4.20 \text{ S. P.}, \div .80 = 5.25 \text{ A. P.}$
- 43  $8\frac{1}{2} \text{ cd.} \times \$7.20 = \$63.36 \div (.20 + .12) = 198 \text{ lbs. of each.}$
- 44  $2.28 \text{ m.} \times 3\frac{1}{4} = 7.16\frac{1}{4} \text{ m. circum.}$   
 $3.8^2 \text{ m.} + 1.14^2 \text{ m.} = 3.96 \text{ m. slant height.}$   
 $3.96 \text{ m.} \times 7.16\frac{1}{4} \text{ m.} \times \frac{1}{2} = 14.1877 \text{ sq. m. surface of sides}$   
 $2.28^2 \times .7854 = 4.0828 \text{ sq. m. area of base.}$   
 $14.1877 \text{ sq. m.} + 4.0828 \text{ sq. m.} = 18.27 \text{ sq. m.}$
- 45  $729 = 3, 3, 3, 3, 3. \quad 336 = 2, 2, 2, 3, 7. \quad 1836 = 2, 2, 3, 3, 3, 17.$
- 46  $\$2675 - \$2225 = \$450. \quad 180 \text{ sheep} : 1500 \text{ sheep} :: \$450 : (\$3750).$
- 47  $\begin{array}{r} 336(84 \text{ G. C. F.} \\ \underline{336(4)} \end{array} \quad \begin{array}{r} 420(84 \text{ G. C. F.} \\ \underline{420(5)} \end{array} \quad \begin{array}{r} 504(84 \text{ G. C. F.} \\ \underline{504(6)} \end{array}$
- 48  $32.5 \text{ m.} \times 32.5 \text{ m.} \times 1.8 = 187.2 \text{ steres}, \div .276 \text{ cd.} = 51.66 \text{ cd.}$   
 $.66 \text{ cd.} \times 188 = 83.48 \text{ cu. ft.}$

49  $\$60 \times \frac{2}{3} \times \frac{3}{4} = \$54.$

50  $\frac{2}{3}$  of 420 gal. =  $282\frac{1}{2}$  gal. +  $87\frac{1}{2}$  gal. = 350 gal.  $350 \div 420 = \frac{5}{6}.$

51 24 T. 4 cwt. 1 qt. 18 lb. = 54,254 lb.  $\times 3$  d. = 162,762 d.  $\times .020\frac{1}{2} = \$3295.93$  cost. 54,254 lbs. =  $24,2\frac{44}{100}$  S. T.  $\times \$142 = \$3852.03$  S. P., - 3295.93 C. =  $\$556.10$  G.

52  $38.18 \text{ m.} \times 73.3 \text{ m.} \times .003 \text{ m.} = 8.395782 \text{ cu. m.} = 8395.782 \text{ kilograms.}$

53 Diff. in time = 6 mo. 17 da. Int. on \$1 for given time  $\$.065\frac{2}{3}.$   
 $\$714.50 \times 1.065\frac{2}{3} = \$761.418.$

54  $\$534 \times 1.04 = 555.36$  amt. of note. Discounted time from Mar. 17 till June 4 = 2 mo. 17 da.  $\$555.36 \times .021\frac{7}{8} = \$11.879$  discount.  $\$555.36 - \$11.879 = 543.441$  proceeds.

55 At one o'clock hour hand is 5 minute spaces ahead of minute hand, and will be overtaken by minute hand in  $1\frac{1}{11}$  of 5 minutes, or  $5\frac{5}{11}$  min. Hence, Ans.  $5\frac{5}{11}$ , min. past one.

56  $\frac{1}{3}$  of 60 min. =  $4\frac{2}{3}$  min. Hence at  $55\frac{2}{3}$  minutes past twelve, or at  $4\frac{2}{3}$  minutes to one o'clock.

57 The principal due each year will be the present worth of the principal for the preceeding year.

1.10)	\$1.00	1st. P. W.
1.10)	.90909	2nd. "
1.10)	.82644	3rd. "
1.10)	.7513	4th. "
1.10)	.683	5th. "
	\$4.1697	total P. W.

$\$5000 \div \$4.1697 = \$1199.08$  amt. of each payment.

# APPENDIX

## ANSWERS TO PRIMARY NUMBER LESSONS

NOTE.—Very few of the examples in the Primary Number Lessons are numbered in consecutive order, nevertheless the careful teacher can easily place the answers as found in this Appendix.

<b>12</b> Page 19	<b>14</b> Page 20	<b>16</b> Page 22	<b>20</b> Page 27	<b>22</b> Page 29	7 7 5 7 2 6 4 6 2 6 4	<b>25</b> Page 32	3 2 1 4 1	5 3 1 3 6 5 3 2 2 6 1 0 4 5 3 2 1 4 0
4	1	1	3	7		6		
3	5	4	1	1		4		
2	2	5	2	0		4		
2	2	3	5	3		2	<b>27</b> Page 34	
1	4	1	1	7		7		
1	2	1	1	7		8		
3	5	5	6	1		8	8	
2	4	2	5	2		7	3	
3	0	0	7	2		6	3	
3	1	1	1	7	<b>24</b> Page 31	7	5	
5		1	1	5		7	8	
				7		8	2	
<b>13</b> Page 19	<b>15</b> Page 21	<b>18</b> Page 24	<b>21</b> Page 28	6	1	8	6	
2	2	5	4		6	7	8	
5	3	2	4	<b>23</b> Page 30	0	0	3	
5	5	4	4	3	7	<b>26</b> Page 33	6	
3	4	2	3	3	4	5	1	
4	5	1	2	4	1	4	3	
1	1	5	3	4	7	5	5	
0	0	1	6	2	4	1		
3	6	4	7	3	3	6	<b>28</b> Page 34	8
1	2	0	2	6	0	3	4	9
1	2	3	1	2	2	2	5	6
5	6	1	5	0	1	4	5	1
		3						

6	34	36	9	2	44	6	3	2
5	Page	Page	2	10	Page	2	5	3
7	40	41	3	1	50	2	2	2
2			3	6		6	2	5
4		3	1		5	6	3	6
9	2	6	3		3	3	10	2
2	3	7	8	42	1	2	3	2
1	4	7	1	Page	2	3	8	
	4	6	9	48	3	8	4	52
	9	3	2		2	2		Page
31	6	(p. 42)	5	4	2	4	50	58
Page	3	1	1	7	5	9	Page	2
37	8	5	8	5	3	3	56	8
	4	4		6	4	5		3
1	2	3		8	8	4		2
2	1	6	39	10	1		2	2
1	4	8	Page	1	2	48	3	3
9	5	2	44	7	6	Page	2	2
1	7	7		3	2	55	4	10
6	2		2	2			6	2
6	8	37	9	9	45	4	10	5
8	4	Page	5	4	Page	8	5	4
9	3	42	2	6	51	3	3	4
8	9		4	4		3	2	3
6			5	1	5	9	2	
5		9	9	7	6	4	5	53
3		4	7		10	4	3	Page
3		10	3	43	4	7	2	59
	35	3	3	Page	5	9	3	
	Page	9	9	49	2	8	3	5
	41	2	8		1	2	4	9
32		1	6	4	6	1	2	10
Page		2	5	1	2	6	2	6
38	6	4	2	1	5			4
	5	9	2	1	6	49	51	12
8	6	4	5	1	6	Page	Page	6
7	3	9	2	5	3	55	57	6
3	3	3	8	1	4			5
4	9	3		8	7			4
4	2	1	40	3	3			5
8	1	3	Page	9		5	2	4
7	5	1	45	1		6	3	4
5	7			2	46	3	5	4
0	8	38	3	1	Page	4	4	5
2	7	43	5	6	52	9	2	1
5	5		10	1		9	3	3
7	2	4	1	10	7	4	10	9
8	9	3	10	8	3	3	3	2
7	4	4	5	5	2	4	6	

## APPENDIX

149

<b>54</b>	2	17	<b>62</b>	5	7-3	11	60
Page	4	14	Page	7	8-11	9	30
60	3	11	69	2	9-12	5	19
2	(p. 64)	15	8	1	10-15-3	8	35
2	3	16	8	2	11-8-4	3	25
12	7	19	4	5	12-2	7	33
8	4	14	7	2	13-8	6	28
2	2		4	8	14-3	2	
5	5	(p 66)	5	3	15-6	12	<b>72</b>
2	4		5	10	16-16	4	Page
5	12	16	4		17-14	4	86
6	6	13	63	<b>65</b>	18-9	14	Col's
4	7	19	Page	Page	19-1	8	51
8	5	18	70	73	3	8	42
3	3	18	7	7	10	8	35
3	5	15	6	4	9	6	40
2		14	8	4	6	2	39
2	<b>58</b>	15	2	16	12		40
3	Page		15	15	2	<b>69</b>	48
	65		5	17	2	Page	47
<b>55</b>		<b>61</b>	6	4	5	82	39
Page	8	Page	2	6	16	9	34
61	5	68	15	14	1	4	Sub'n
6	5		13	15	18	9	Omit
2	5		10	8	4	5	2
6	7	4	9	19	9	16	18
1	9	2	9	0	2	8	10
6	1	2	7	12	1	8	6
2	4	2	8	14	6	5	2
2	4	4	7	7	4	3	9
8	3	4	5	2	7	4	11
4	4	8	1	7	1	3	4
10	3	6	11	7	10	6	4
9	2	3	10	2	5	9	3
9	2	6	1		3	2	
4	5	5	5	<b>Review</b>	4	1	<b>73</b>
4	2	2	3	Page	9		Page
7		10		77		<b>71</b>	88
	<b>59</b>	3	<b>64</b>		<b>68</b>	Page	
<b>57</b>	Page	5	Page	1-15	Page	84	2
Page	65	8	71	2-15	80		5
63		5		3-12		Col's	7
3	13	5	2	4-3	15	47	4
8	18	8	2	5-14	3	59	4
10	14	2	2	6-10	6	20	13



2	<b>75</b>	<b>78</b>	<b>83</b>	<b>90</b>	<b>91</b>	Col's	3304
13	Page	Page	Page	Page	Page	3237	3626
3	90	94	101	112	114	892	1035
9						952	852
4	Cols	8	Col's	249	245	557	1078
3	73	9		78	389	1809	3320
17	58	7	35	191	88		5364
11	50	26	42	118	199	subt.	2340
3	53	18	49	119	88	263	5357
15	60	13	47		116	659	3656
14	51	23	43	Col's	86	476	4590
Col's	50	5	40		538	366	3960
50	59	13	41	1340	159	25	348
47	52	13	39	469	546	89	2067
40	60	(p. 95)	37	1301	377	173	2653
58		2		617	477	480	3184
43	subt.	8	<b>89</b>	572	53	158	2502
51	omit'd		Page	555	29	374	5477
50	(p. 91)		111	(p 113)	147	57	276
51	18	<b>81</b>		213	172	587	2095
35	3	Page	637	181	496	458	13,456
50	3	98	549	522	454	395	409
	12		454	123	279	372	(p 117)
<b>74</b>	14	6	569	231	165	67	
Page	15	12	517	712	133	240	4473
89	4	27	478	102	89	149	8385
46	7	8	406	314	285	32	2750
91	2	15	665	624	304	38	28,931
40	9	2	454	635	8038	214	3058
70		9	500	340	3664	10	
34		12	611	205	19,476	99	subt.
47	<b>77</b>	22	546	414	11,672	576	
41	Page	20	78	512	6858	263	174
69	93	2	49	744	4803		652
11		13	47	513			127
77	Col's	24	6	520	<b>92</b>	<b>93</b>	250
62	78	27		506	Page	Page	1
68	68	21	(p.112)	96	114	116	101
21	67	10		40			83
72	62	15	12	66		2148	371
78	49	6	11	5	1135	4368	344
6	39	9	6	12	2903	5628	383
42	43	3	3	4	22	516	536
44	53	18	24	10	(p 115)	5016	116
5	46	12	68	120	4800	1724	259
31	45	2	53	99	250	3069	378
		12	10	70	156	675	488

243	142-1	\$825	216,909	103	133
522	90-5	52 hrs.	62,444	Page 129	6
477	64	21 bbl.	92,542		5
608	76-1	126	26,662	1-5	8
638	92	197-3	•	2-10	66
	61-2	11172	Review	3-18	22
	16-5	6889	Page 124	4-3	
94	71-4	1836		5-9	
Page 117	33	366-3	1-46	6-4	
\$1.68	43-1	2472	2-1 ct.	7-24	106
230	279-1	761-2	3-54	8-7	Page 133
\$6.76	49		4-9		
322	62-2	98	5-6	104	1-16
980	36-2	Page 122	6-5	Page 130	2-21
(p. 118)	47-1		7-27		3-10
\$1940	85-2	849½	8-56	1-1	4-24
1872	82-5	237½	9-5	2-2	5-3
17	86	932½	10-8	3-5	6-15
7	45-2	243½	11-28	4-96	7-48
4	87-9	(p. 123)	12 {20 c.	5-W	8-8
8	36-4	582	12 {25 c.	6-10	9-60
11	86-3	395½	13-\$24	7-8	10-12
5	85-1	973½	14-\$6	8-75	
7	58-2	753½	15-9 y's	9-10	
34	358	493½		10-195	1st Col.
0	83-3	489	100	27,189	36
4	94-3	647½	Page 125	69,247	96
8	57-6	485½		62,048	35
7	79-1		1-28	87,720	24
18	52-5	99	2-18		77
4	53	Page 123	3-21	105	24
72	48-8		4-4	Page 132	36
77	47-2	1-10	5-4		45
63	23-6	2-2	6-6	Last Set	77
144	39-1	3-7	7-24	3	42
2	58-1	4-6	8-6	12	
3	76-3	5-5	9-54	27	2nd Col.
6	62-1	6-7	10-36	5	
70		7-5	63	7	24
60		8-10	119	4	62
6	96	9-6	9	48	32
	Page 119	10-7	7	6	91
	\$4375	11-5	15	6	60
95	25 doz.	12-6	8	8	40
Page 119	15 p'ncil	(p. 124)	52	132	27
79-3	(p. 120)	13-3	95	25	42
56-8	150 yds.	47,801	132	6	16
			11	6	55

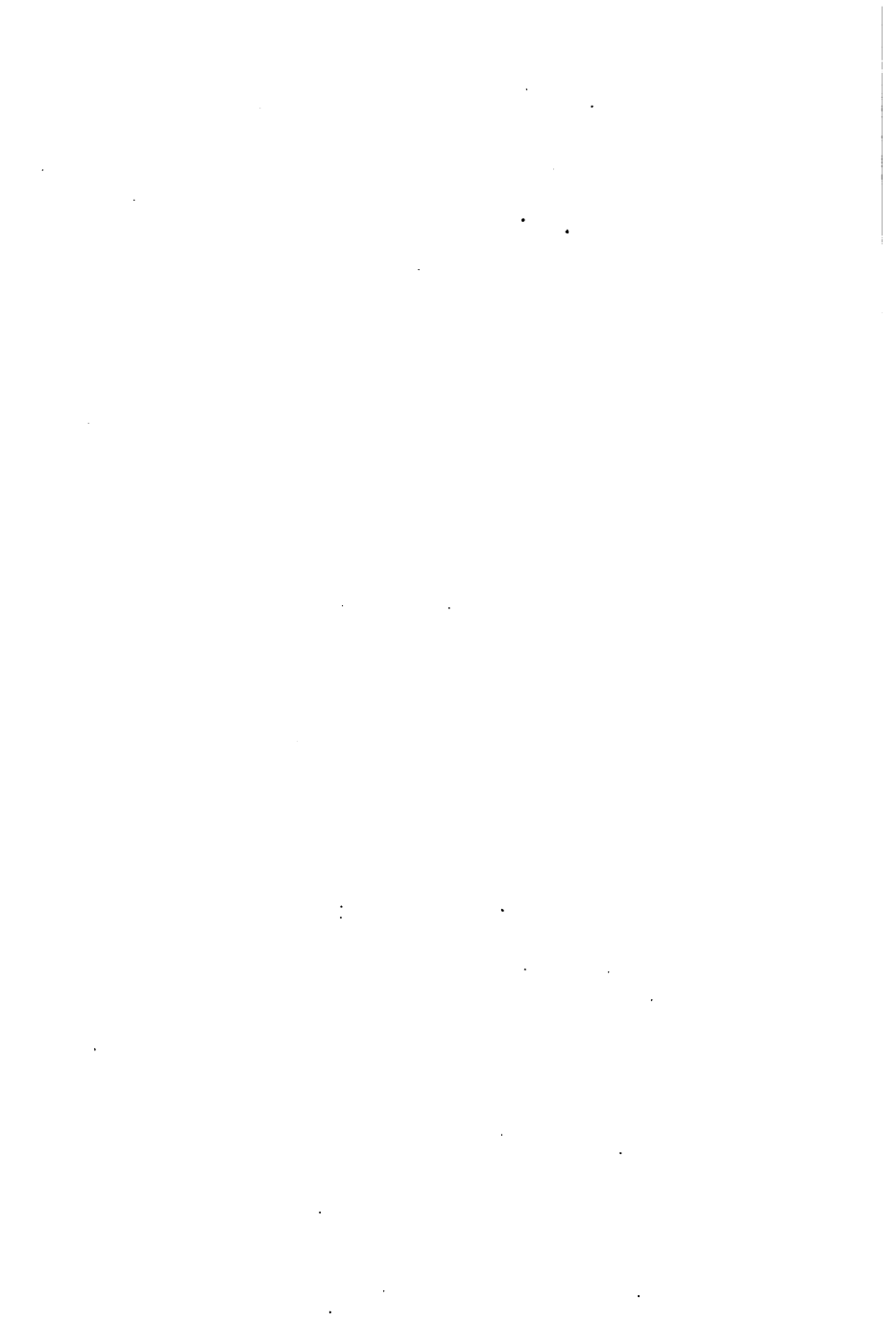


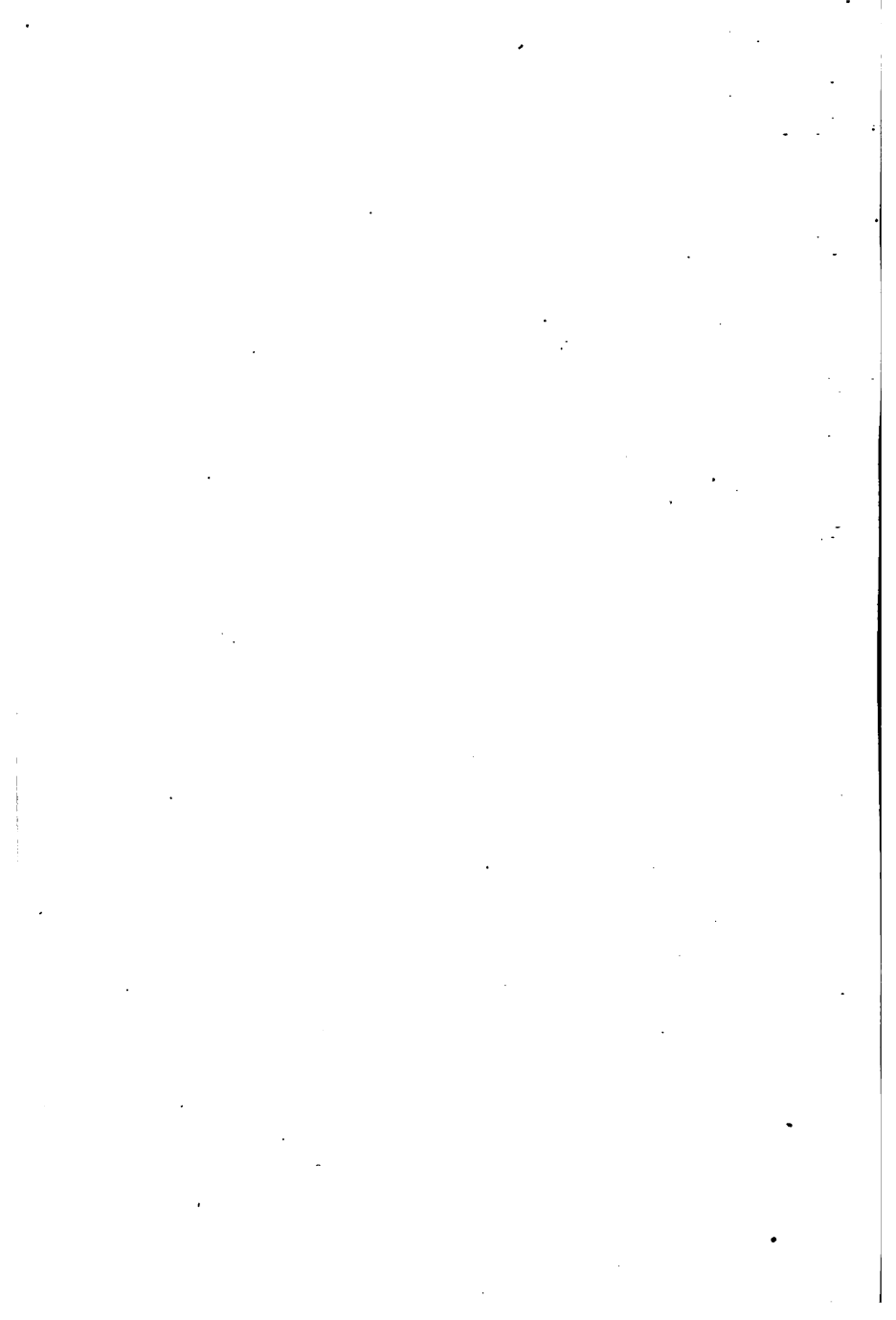
## APPENDIX

153

53—159,637	90—134	125— { 31,246 $\frac{1}{2}$
54— { 78,272	91— $\frac{1}{2}$	{ 28,754 $\frac{1}{2}$
{ 4,936	92—30	{ 16,827 $\frac{1}{2}$
55— { 334,825	93—6 $\frac{1}{2}$	126—29,285
{ 242,779	94—53 $\frac{1}{2}$	127—5,720
56—16	95—30	128—12 cts.
57— $\frac{3}{8}$ , $\frac{1}{2}$ , $\frac{3}{4}$	96—7	129—24 cts.
58—48 cts.	97—5	130—117 sq. ft
59—5 days	98—2	131—4 days
60—88	99—30	132—5 hrs.
61—12	100—6	133—11
62—8	{ 23,456 $\frac{1}{2}$	134—11
63—12	101— { 54,321	135—114
64—8	{ 7,392 $\frac{1}{2}$	136—7
65—36	{ 12,468 $\frac{1}{2}$	137—30
66—1	102— { 690,760	{ 7,891 $\frac{1}{2}$
67—3579 $\frac{1}{2}$	{ 34,150	138— { 19,465
68— { 65,791	103— { 351,845	{ 15,864 $\frac{1}{2}$
{ 129,070	{ 27,158	139—9
{ 74,976	{ 481,382	140—19 $\frac{1}{2}$
69—18 $\frac{1}{2}$	104—653,584	141—4 $\frac{1}{2}$
70—33	105—18	142—57
71—14	106—10 cds.	143—9
72—11	107—54	144— { 7,293 $\frac{1}{2}$
73—32	108—1	{ 13,597 $\frac{1}{2}$
74—2 $\frac{1}{2}$	109—12	145— { 183,750
75— { 31,884	110— $\frac{1}{10}$	{ 58,583
{ 91,877	111—60	{ 195,276
{ 21,816	112—54	126— { 982
76— { 29,259	113—4	{ 236,407
{ 101,940	114—10	147— { 6,879 $\frac{1}{2}$
{ 87,199	115—24	{ 9,837 $\frac{1}{2}$
77— $\frac{1}{2}$	116—11	148—2
78—16	117—67	149— $\frac{1}{2}$
79—24	118—5 cts.	150— $\frac{1}{8}$ , $\frac{1}{4}$
80—40 cts.	119—45	151—6 p'nc'ls 2c
81— { 9,631 $\frac{1}{2}$	120—\$4.80	152—\$48
{ 2,486 $\frac{1}{2}$	{ 58 $\frac{1}{2}$	153—\$.71 $\frac{1}{2}$
{ 12,435 $\frac{1}{10}$	121— { 15 $\frac{1}{2}$	154—84
82—6000	{ 48 $\frac{1}{2}$	155—1 $\frac{1}{2}$
83—99,534	122—21	156—6
84—5	{ 463,305	157—4
85—8	123— { 34,619	158—5
86—54	{ 54,185	159—14 $\frac{1}{2}$
87—15, 27	{ 55,926	160—15
88—5 $\frac{1}{2}$	24— { 33,741	161—6 $\frac{1}{2}$
89—17	{ 449,184	







YB 12519





